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Cancer control in the Pacific: A South Pacific collaborative approach

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Keywords

Cancer epidemic control; Pacific; Collaboration

1. Introduction to the pacific islands region

The Pacific island countries and territories (PICTs) are scattered over an ocean area, 165 million square kilometres. There are 22 PICTs who are Members States in the World Health Organization (WHO) Western Pacific Region and the Pacific Community (SPC), two leading scientific and technical organizations in the Pacific region: American Samoa, Cook Islands, Federated State of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Wallis and Futuna [1], indicated in the map. Most of the northern hemisphere Pacific islands have ties with the U.S.A. to some extent (U.S.-affiliated Pacific islands; USAPIs), while southern PICTs are a mixture of developing sovereign nations or self-governing territories of larger nations such as New Zealand, France or the United Kingdom. Australia also holds influence in the region.

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Authors contributions

1. **Sunia Foliaki** is the corresponding and leading author. Foliaki contributed to the conception and initial discussions on potential for collaboration in the design and review of appropriate work from the Pacific on cancer control. Foliaki participated in and collaborated in various Skype sessions and correspondence throughout all stages of the writing and approval of the final version of the manuscript that is submitted
 2. **Chris Bates** contributed also to the conception and collaboration in the design and review of various work in the Pacific on cancer control. Bates led the review of potential global and regional partners in cancer control outlined in the single Table of the manuscript. Bates also participated in all Skype and correspondence throughout the design, writing, reviews and final approval of the manuscript.
 3. **Isimeli Tukana** worked closely with Chris Bates in the design and approval of the Fiji cancer control programme and provided valuable input to the proposed collaboration recommended in the manuscript from a national and regional perspective. Tukana had also reviewed, commented and approved the final and submitted manuscript
 4. **Neal A. Palafox** is a leading cancer medical practitioner and Professor at the University of Hawaii and also oversees various aspects of the Northern Pacific Cancer Control Network and the University of Hawaii Cancer Centre. His contribution involved outlining and demonstrating collaborative cancer control programmes he is leading in the Northern Pacific as a model to inform the discussions and recommendations outlined in the manuscript. Palafox has been involved in all stages of the writing, revisions and final approved version of the manuscript. Palafox was responsible for the final review of the manuscript.
- All the authors agree to be accountable for all aspects of the work.

The PICTs are culturally diverse, separated roughly into three geo-cultural groups: Melanesian, Micronesian and Polynesian peoples, who have a mixture of cultural customs, languages and beliefs. In the southern region, the sovereign country of Papua New Guinea (PNG) is the largest PICT with approximately 8.1 million people and is challenged to provide adequate health services through reduced health expenditure in recent years. New Caledonia, supported by France, provides a more advanced and resourced service in a country of 272,700 people. Tokelau is the smallest PICT with approximately 1160 people, and is mostly reliant on out of country medical referrals, even for diagnosis [1,2]. Pacific peoples have acquired the associated risk factors for cancer and non-communicable diseases (NCDs). The western economy and lifestyle has shaped the demographic and epidemiological transition in the PICTs. The epidemic proportions of the so-called diseases of affluence, NCDs, now sit on top of an unfinished and reemerging agenda of Communicable Diseases (CDs).

Cancer is a significant and growing problem in the Pacific. Through convention, population health planners have housed cancer control under NCD prevention and control, the result being that cancer has become overshadowed by other diseases in NCDs programmes which includes cardiovascular diseases, diabetes and chronic respiratory illnesses. The high rates of cervical cancer and liver cancer in the Pacific however indicates the important role of CDs (CDs) in the prevention and control strategies of certain cancers. At the same time breast cancer represented a significant cancer burden among women and lung cancer as the most important cancer burden among men in a previous study in four PICTs [3], with prostate cancer having been reported as the second most common cancer among men in at least two and the leading cancer in two other PICTs [3,4]. Environmental risk factors for cancer are also well documented as well as specific exposures such as a history of significant exposure to ionizing radiation from thermonuclear weapons testing, unique to the Pacific islands. The long latency period for some radiation-induced cancers must be acknowledged in an environment of poor quality data [5,6]. This raises the importance of research in the above exposures linked to cancers which are not well studied in the Pacific including studies on the use and lack of regulations for the use of pesticides [7], or contamination of the food chain in some islands due to the use of polychlorobiphenyl (PCBs).

There are mixed methods for controlling the mixed cancer epidemiology across the south Pacific, and a general lack of guiding data, in an environment where some PICTs are highly resourced and have significant political links, while others are developing sovereign nations. Teamwork, via a south Pacific cancer coalition is proposed, to share experiences, activities, research and resources for improved population outcomes.

2. The current situation of cancer control in several PICTs

Determining the cancer burden in the Pacific in terms of morbidity, survival and mortality involves different obstacles to those encountered in more developed countries. In particular, cancer registration and information systems among many Pacific islands countries are often of questionable quality and comprehensiveness [3]. Where cancer numbers are low (in absolute terms), there is often little justification to have one staff dedicated to a registry or any registry at all. Data collection within countries may be inaccurate due to the methods of

family, support networks, traditional healers and faith based institutions. Each country understands their particular challenges in cancer control.

Addressing the challenges may be facilitated through a cancer control partnership at a south Pacific regional level. Common goals, areas for synergy, and sharing successful programs must be considered in planning such a partnership. Local leadership should take a strong coordination and development role to this end. PICTs would be greatly improved by approaching them with a regional coalition, rather than separate PICT management.

3. Proposed model for regional cooperation

A south Pacific regional cancer coalition (SPRCC) could have several functions with respect to cancer control including mobilization and harmonizing resources of the region; coordination and sharing of local expertise, and exchanging successful cancer intervention programs. A regional collaboration could also be available to assist with organizing cancer related surveillance, evaluation and research.

An SPRCC may have regional cancer control planning capacity to address with regards to cancer related medical supplies, services, and staff. The south Pacific PICTs could benefit from a body that coordinates referral of cancer patients in/out/within the region; as well as advising optimal distribution of technical and financial assistance for cancer control that comes into the south Pacific. Thinking further, an SPRCC could also provide a coordinating partner with IARC for a regional cancer registry, as well as host regular meetings, virtual or in person, for countries to share their cancer control successes and challenges.

Cancer treatment capabilities are known to be resource intensive, but much needed. Smaller and resource limited PICTs can pool resources, and dissipate the individual PICT financial risk for the greater Pacific welfare. A well-managed SPRCC should provide a greater opportunity for all those suffering from cancer to access the appropriate services they need. The SPRCC can mobilise regional partnerships and link with international organisations, representing the south Pacific as a coordinated team fighting cancer with one voice.

4. The opportunities

It might seem like a formidable task to begin such a coalition, but in fact the regional network models have been operationalized elsewhere. Firstly, the International Agency for Research on Cancer (IARC, within WHO) has identified the need for a Pacific regional 'Hub' cancer registry, which would aggregate cancer data from several Pacific island countries. The Pacific Hub for the south Pacific remains at a formative stage, and a host organization or country is yet to be confirmed. In the north Pacific, this is essentially one of the roles of the Cancer Council of the Pacific Islands (CCPI), which initiated the Pacific Regional Central Cancer Registry (PRCCR) in partnership with the Centre for Disease Control and Prevention (CDC).

The partnership between NZ and the south Pacific (especially Fiji, Tonga and Samoa) is becoming fruitful in the realm of paediatric cancer management. There are clear governance structures with a NZ working group under the National Child Cancer Network. Open

communication between these countries is vital. The dedicated teams of paediatricians tele-conference regularly with colleagues in Christchurch for guidance on improving domestic patient outcomes and improved treatment protocols in the PICTs. Children from Fiji are regularly referred to Starship Children's Hospital in Auckland for treatment and Fiji readily accepts children from nearby PICTs (e.g. Kiribati, Vanuatu) where possible. In addition, a Pacific Children's Cancer Registry: a web-based platform which offers a window to accessing cancer registries in these three countries [13] is being piloted. In December 2016, a Pacific Island Child Cancer Regional Conference was held in Nadi, Fiji. Stakeholders from 8 countries shared knowledge around areas of medical treatment, nursing, and social support. This spirit and success of the National Child Cancer Network collaboration demonstrates what is possible through regional collaboration, and could be scaled up towards a regional cancer coalition. A Pacific Palliative Care Network has been established in New Zealand with a focus on the Pacific.

A south-south cooperation to improve radiotherapy availability reveals great promise. PNG has an under-resourced service with plans to expand service coverage and quality, French Polynesia has a functioning service with two bunkers, and Fiji also has plans to introduce radiotherapy. Unfortunately, there is not very much communication between the centres. PNG and Fiji have great opportunity to learn from New Caledonia also, where radiotherapy has successfully been introduced in late 2016. A SPRCC which includes the French Pacific territories would facilitate sharing the knowledge, skills and resources which led to the successful implementation in New Caledonia and sustained service in Papeete.

The north Pacific USAPIs provide a model of organization and partnership that can guide an SPRCC. Cancer prevention and control in the USAPIs has been managed through synergistic planning, and through both local and regional cancer coalition development [14]. Cancer control planning is very strong in the north Pacific, each of the USAPIs have a national cancer control plan, the Federated States of Micronesia have state-level plans, and one overarching Pacific Regional Comprehensive Cancer Control Plan was developed for 2007–2012 [15]. In the southern Pacific region only 3 of the 15 countries have plans to control cancer, each nested within their respective NCD strategic plan [16].

Through the planning and organization of the USAPI Cancer Programs have been several notable outcomes: there have been cancer needs assessments performed in each of the jurisdictions, the jurisdictions are able to articulate and act on their priority cancer prevention and control strategies, the USAPI jurisdictions are in the third cycle of developing their respective 5 year cancer prevention and control plans, the region is linked by a common cancer registry, cancer research has been initiated in priority areas through efforts of the organization, evidence based strategies for cancer prevention are being developed, and human resource and program funding has been leveraged in excess of US\$30 million since the beginning of the programs [17].

5. Steps to building a regional cancer coalition

5.1. Creating and maintaining a PICT team that can articulate the cancer health needs of all Pacific people

This initial step is crucial. Leadership and advocacy from a coalition or an institution with positional and vocational influence is required to develop a multi-lateral regional cancer prevention and control initiative. The leadership team would promote and establish partnerships with other PICTs towards a common goal to prevent, reduce and control cancers. A well-articulated workplan to develop a regional partnership, and a communication strategy between partners would help to build the foundational elements of a successful regional team.

The regional initiative does not necessarily need to be government developed and driven; however the respective PICT governments and health services should be an active partner. The existing workload of government health services and public health systems may prohibit the investment of significant human or financial sources in this effort. Therefore, local cancer societies may be more suitable to take on the task. A key element is that the leadership team is positioned and networked within the south Pacific, and that equal representation from all PICTs is developed.

The CCPI may render technical assistance to form an initial coalition with 4 to 5 PICTs. The authors suggest the PICTs of New Caledonia, Fiji, Niue and PNG or Tonga to mobilize the regional effort (shown in the map). These PICTs have been selected due to their perceived degree of readiness for better cancer prevention and control, their potential resource contributions. With varied population size and profile, differing political ties, health systems and geography, these PICTs will have diverse experiences and a wealth of practical knowledge to begin regional cancer prevention and control planning.

5.2. Collaboration with regional centres of excellence and cancer control

The SPRCC working principles should include sustainable cancer prevention and control initiatives, while building the local health capacity. Mindful that the south Pacific should remain as autonomous as possible, requesting assistance from outside organisations may be necessary when there is a meaningful plan in place, when additional innovative solutions are needed, or when implementation of cancer prevention and control projects require large investments for good cancer health outcomes. The SPRCC would facilitate the realisation of other critical components for cancer control such as training of human resources and developing relevant local cancer research at the local or regional level.

There are many organizations that could be available to partner with the PICTs regional cancer control efforts. A list of existing organisations or organisation types is given in Table 1. Most organisations are willing to discuss partnership in some form and enthusiastic to meet (Table 2 Fig. 1).

5.3. Regional needs assessment

The feasibility of a SPRCC would be strengthened (with regard to seeking funding) if supported by a regional assessment that demonstrates a need and commitment by the PICTs to begin the effort, – A needs assessment was performed via the Pacific Cancer Initiative for the USAPI's in 2002–03 [18]. A similar needs assessment, which may be more suited to low-resource settings, such as the WHO-IAEA NCCP Core Self-Assessment Tool [19] may be ideal. The evidence-based regional assessments would also address some regional development partner concerns of a mismatch between the disease burden and the global response when cancer and NCDs are compared with HIV/AIDs [20]. It will be vital that participants agree on open access and unimpeded sharing of national information on cancer.

6. Conclusions

There are multiple Pacific perspectives, and competing health care and cancer care priorities that challenge a strategic focus on cancer control. Cancer surveillance and data systems such as cancer registries that provide the data necessary to understand the shifting cancer risks profiles of each island jurisdiction are lacking. Cancer prevention and screening, tools and technologies have variable penetration in small island countries due to organization, financial, human resource, and planning challenges.

Effective cancer prevention and control in resource limited island nations will require a systematic approach with a multi-lateral dedicated group who are from within and vested in the Pacific, who can represent the people, governments and health care systems, and who have expertise in domains of cancer prevention and control is necessary. There are existing Pacific based regional models in cancer prevention and control, NCD management, and paediatric care which demonstrate that development of a SPRCC is feasible. A South Pacific Regional Cancer Coalition will provide this leadership and is a necessary start which should be developed immediately.

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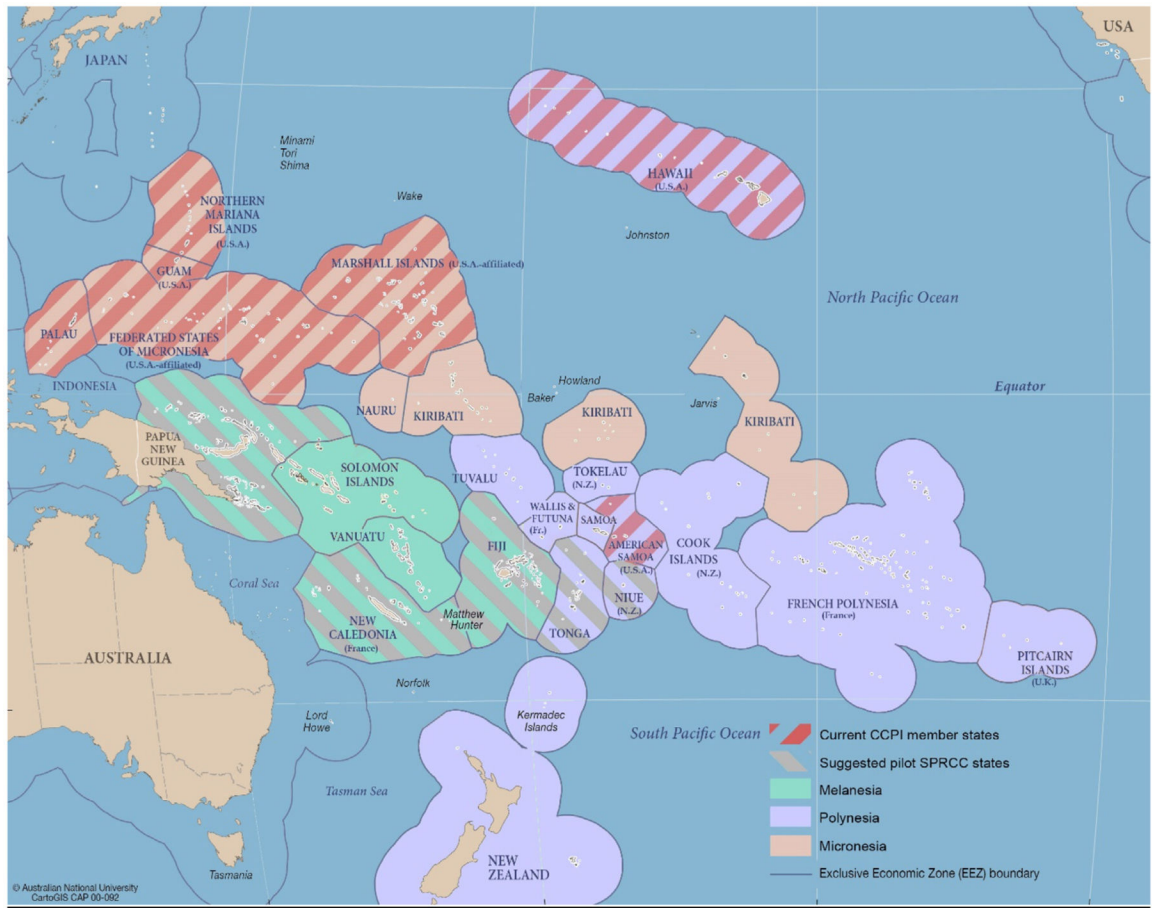


Fig. 1. Map with countries of the Pacific Islands Countries and Territories.

Table 1

A shortlist of potential stakeholders and partners in cancer control in the south Pacific.

Position	Stakeholder	Area
Local	Faith based organisations	Health promotion
	Ministry of Foreign Affairs	Treatment
	Private health care providers	All
	Private laboratories	Diagnosis
	Ministry of Finance	All
	Private businesses e.g. banks, retail	All
	Education institutions	Capacity-building
	Cancer societies/support organisations	All
	PNG National Cancer Treatment Centre	Treatment
	Overseas universities and university hospitals	Capacity-building
International	Hospital networks	Treatment
	Existing overseas referral destinations	Treatment
	Medical tourism operators/investors	Treatment
	Australia: Department of Foreign Affairs & Trade/Fiji & Tonga Health Sector Support Programmes	Health promotion, prevention & screening
	Indian Development Partnership Administration	Potentially any
	Korean International Cooperation Agency (KOICA)	Potentially any
	Taiwan International Cooperation and Development Fund	Potentially any
	China Aid	Potentially any
	NZ Aid Programme (MFAT)	Potentially any
	Japan International Cooperation Agenc	Health promotion
	USAID and US Department of Defence	Treatment
	EuropeAid	Potentially any
	Agence Française de Développement	Potentially any
	Overseas cancer centres	Staff training Capacity building, expertise, treatment
	• Korea National Cancer Centre	
	• Peter MacCallum Cancer Centre	
	• Centre Radiotherapie de Nouvelle Calédonie	
	PICT Ministries/Departments of Health	Advocacy, capacity building

Position	Stakeholder	Area
	Medical technology manufacturers and distributors	Clinical services
	<ul style="list-style-type: none"> • Varian Medical Systems • Elekta • GE Healthcare • Siemens • Neusoft Co. • Shinva Medical Instrument Co. • Philips Radiation Oncology 	
	Chemotherapy product manufacturers	Clinical products
	<ul style="list-style-type: none"> • Cipla limited (India) • Inias pharmaceuticals Ltd. • Biochem pharmaceutical industries • Baxter pharmaceutical 	
	Practitioner societies	Capacity building, expertise, training
	<ul style="list-style-type: none"> • Australian Institute of Radiography • American Society for Radiation Oncology • European Society for Radiation Oncology • Royal Australian College of Surgeons • Royal Australian and New Zealand College of Radiologists • Pacific Medical Association • Pacific Islands Health Officers' Association 	
Regional	World Health Organisation (South Pacific Office)	Various
	Asian Development Bank	Various (Finance)
	Secretariat of the Pacific Community	Pre-clinical
	Cancer Council of the Pacific Islands	Advocacy, expertise
	SSCSiP: Strengthening Specialised Clinical Services in the Pacific	Clinical services
Global	World Bank	Various (finance)
	New Development Bank	Various (finance)
	Union for International Cancer Control	Various
	International Agency for Research on Cancer	Data management, staff training

Position	Stakeholder	Area
	United Nations Development Programme	Various
	Small Island Developing States Network	Potentially any
	Gates foundation	Pre-clinical and advocacy
	International Network for Cancer Treatment and Research	Capacity building, research
	Axios International	Capacity building, advocacy
	World Child Cancer	Capacity building, diagnosis, treatment
	International Atomic Energy Agency	
	OPEC Fund for International Development	Training, expertise and procurement
	International Society of Nurses in Cancer Control	Various (finance)
	Clinton Health Access Initiative	Staff training
	International Cancer Control Partnership	Procurement of medicines
		Planning

Table 2

Estimated Cancer Incidence, Mortality, both sexes, PICTs.

Men						
Pacific Island Country	Population (1000)	Estimated Cases	Estimated Cases ASR (W)	Estimated Deaths	Estimated Deaths ASR (W)	
Fiji	446	340	91.3	239	65.4	
French Polynesia	141	392	287.4	216	153.9	
Guam	93	194	198	103	105.4	
New Caledonia	129	475	330.7	211	145.9	
Papua New Guinea	3657	2908	156.7	2285	131.6	
Samoa	95	63	92.5	43	64.4	
Solomon Islands	292	153	89.3	128	77.9	
Vanuatu	128	81	98.2	71	87.9	
Women						
Pacific Island Country	Population (1000)	Estimated Cases	Estimated Cases ASR (W)	Estimated Deaths	Estimated Deaths ASR (W)	
Fiji	429	795	189.3	418	104.3	
French Polynesia	135	327	227.3	163	116.3	
Guam	90	148	143	59	54.7	
New Caledonia	129	411	269.3	168	112	
<i>Papua New Guinea</i>	3512	4457	179.8	2889	124.5	
<i>Samoa</i>	89	74	96.1	38	49.4	
<i>Solomon Islands</i>	273	281	145.1	165	94.6	
Vanuatu	123	108	117	56	66.6	

ASR (W), age-standardized rate for world population per 100,000.

Countries in italics used estimates from other countries (with similar characteristics to them) to compute the estimates. Source (*with permission*): Varghese, C., M. C. Carlos, and H. R. Shin. 2014. Cancer burden and control in the Western Pacific region: challenges and opportunities. *Ann Glob Health* 80(5):358–69.