

## Original Article

Pacific Island publications in the reproductive health literature  
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**Background:** There is a keen interest to develop research systems and increase research output in the 14 Pacific Island Forum Countries (PIFC) to support development of policies and practice based on locally relevant research evidence.

**Aims:** To assess the quantity and characteristics of reproductive health research output by each country (14 PIFC) from 2000 to 2011 using New Zealand's reproductive research outputs as the reference.

**Methods:** A systematic search of the literature using a broad definition of reproductive health.

**Results:** There were 174 papers published in the PIFC from 2000 to 2011 compared with 628 papers published in New Zealand (NZ). Most (57%) of the PIFC papers were from Papua New Guinea (PNG), although Samoa had the most papers by population (10/100 000). Five of the countries did not have a single publication. The majority of papers from both the PIFC and NZ were observational studies (72 vs 36%). Authors from Australia were responsible for 34% of PIFC publications followed by 25% from PNG. Sixty-three per cent of papers by PIFC sole and first authors were published in local journals, whereas 86% of non-PIFC authors published in international journals.

**Conclusion:** There is a need for reproductive research in PIFC. PNG had the most publications on the back of a well-funded dedicated research institute and a significant collaboration with Australian researchers. The large number of papers in PIFC countries without PIFC authors raises the question about the need to require non-PIFC researchers to enter into genuine research partnerships in order to build research capacity in the PIFC.

**Key words:** Pacific Islands, research capacity, research ranking, research publications, reproductive health.

## Introduction

Relevant health research evidence is an important component of nation building as research evidence informs sound health policy and practice.<sup>1</sup> Yet, only 10% of the world's research funding is spent on the diseases that burden 90% of the world's population who mostly reside in developing countries<sup>2</sup> such as those in the Pacific. The potential for developing countries to benefit from research is huge<sup>3</sup> but despite calls by the World Health Organization (WHO),<sup>4</sup> the Council on Health Research for Development (COHRED)<sup>5</sup> and other international agencies, the inequity in research investment has largely persisted.<sup>6</sup>

Research in reproductive health is an important component of health research. Good reproductive health research, especially in clinical and public health, is needed to inform policies and interventions in countries with a huge disease burden. Developing countries in the Pacific have high rates of sexually transmitted infections and maternal and perinatal morbidity and mortality.<sup>7</sup> The under-resourcing of health research systems affects a country's ability to find local solutions to local reproductive health issues.<sup>8</sup> Decisions on the use of limited resources for health services therefore are rarely guided by robust local research information.<sup>1</sup>

The 14 members of the Pacific Island Forum Countries (PIFC) were reported, in a research mapping exercise by WHO in 2007, to lack the necessary investment in research systems, research policies, research priorities and the research workforce.<sup>9</sup> Recommendations for capacity building included collaborations with global and regional research partners especially in Australia and New Zealand (NZ). There have been concerns however that the research activities by overseas researchers have not

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resulted in the development of indigenous Pacific people as researchers.<sup>10</sup> The training and support of local people as researchers is an important part of capacity building as they add value with their understanding of local priorities, local culture and local context, and they are more likely to see research as part of continuous quality improvement of their health services.<sup>11,12</sup>

The PIFC comprise the Micronesian states in the north, the Melanesian countries in the east, to the Polynesian islands in the southwest. They have a combined population of approximately 10 million with Papua New Guinea (PNG), the most populous with 6.6 million.<sup>13</sup> The member countries are at varying degrees of economic and social development<sup>14</sup> with varying health outcomes. Melanesian and then Micronesian states have higher disease burdens compared with Polynesian countries.

The SCImago bibliometric ranking of research prestige by country has placed five PIFC in the bottom 10% of 236 countries.<sup>15</sup> Although there are other variables that can be measured to determine a country's research activity such as the budget allocated for research, number of researchers and reproductive health specialists, these are fraught with problems as most of the PIFC do not have these capabilities.<sup>9</sup> Although the number of publications and the ranking systems is a crude measure, it may be the best measure available,<sup>16</sup> particularly for a baseline for further research. There has been no ranking system for the number or quality of publications in reproductive health by country. In developing countries, such as those in the Pacific, it is important to capture non-refereed opinion pieces as formal research outputs are often limited. Where local quality research evidence is lacking, opinions from experts and others are important in the setting of national health priorities and standards.

In order to determine how to build reproductive health research activity and capacity in the PIFC, it is an important first step to map reproductive health research activity. We undertook a systematic search of the literature to determine the number and type of reproductive health publications from the PIFC, and we used NZ as a reference because it has a Pacific population that comprise 6.9% of a population of 4.5 million.<sup>17</sup>

## Materials and Methods

### *Inclusion criteria for literature search*

The inclusion criteria were 'any paper in reproductive health published on or about PIFC participants from 2000 to 2011'. A broad definition of 'reproductive health' was made which included but was not limited to gender-based violence and issues, depression, gynaecological malignancies, urinary incontinence and breast screening. Similar inclusion and exclusion criteria were applied to NZ papers. The 14 PIFC are listed in Table 1. Studies from outside this 14 group of Island countries were excluded. Studies by authors in the PIFC and NZ on populations outside the PIFC and NZ were excluded.

**Table 1** Grading by number (%) of papers by PIFC and New Zealand (NZ), compared with the SCImago grading 2006–2010 for all articles in Medicine and number of papers per 100 000 population

Country	Numbers N = 174 (%)	SCImago world ranking	Number of papers per 100 000 population
PNG	99 (56.9)	111	1.5
Samoa	19 (10.9)	193	10.0
Vanuatu	15 (8.6)	182	6.7
PanPacific	14 (8.0)	N/A	N/A
Fiji	10 (5.7)	148	1.1
Solomon Is	7 (4.0)	179	1.2
Tonga	6 (3.4)	189	5.7
Micronesia	2 (1.1)	192	1.7
Kiribati	1 (0.6)	217	0.9
Marshall Is	1 (0.6)	205	1.5
Cook Is	0 (0)	216	0
Palau	0 (0)	203	0
Nauru	0 (0)	NR	0
Tuvalu	0 (0)	220	0
Niue	0 (0)	NR	0
NZ	628	29	13.9

Pan-Pacific: studies that covered more than one country or were general Pacific in nature.

N/A, not applicable; NR, no ranking; PIFC, Pacific Island forum countries; PNG, Papua New Guinea.

Multi-centre studies involving participants or populations in PIFC and NZ were included. Laboratory-based studies were not included for PIFC have limited laboratory research capability, and exclusion of these publications makes a fairer comparison with NZ's publications in clinical and epidemiological research. Breast screening and breastfeeding papers were included, but papers on breast cancer were excluded as general surgeons usually manage these, so they are outside the area of expertise and research of those working in reproductive health.

Limits were applied to make the analysis manageable without affecting the objectives of the study. The limits applied were period (2000–2011) and language (English). The body of literature therefore comprises all clinical and epidemiological papers in reproductive health including reviews and opinion pieces.

### *Search method*

Two researchers (AE, TP) independently searched the Cochrane Database of Systematic Reviews, Medline, Embase, CINAHL, ERIC, Scopus, IndexNZ, Geobase and PsychINFO. An additional search was carried out of the SCOPUS database using names of known Pacific and NZ researchers, research institutions and universities. All the issues of the NZ Medical Journal and the Pacific Health Dialogue (PHD), in the search period, were hand-searched.

### **Data collection**

Citations identified by the two independent searches of all the databases were downloaded into Endnote® reference management software. One researcher (AE) then repeated the search exclusively for NZ articles, and the other (TP) searched exclusively for Pacific articles. Additional citations were downloaded separately into separate Endnote databases with one (AE) managing the NZ one, and the other (TP) managing the Pacific one. Duplicates were removed, and using the exclusion criteria, the unrelated citations were removed. For validation, the reviewers independently coded 200 citations (made up of 100 excluded and 100 included papers) from the other's database.

### **Data extraction**

All included citations were copied to a Microsoft Excel® spreadsheet for coding. Coding was performed according to their study design, purpose and name of journal. Full text of Pacific papers were obtained to extract data author information and coded for ethnicity/institutional affiliation of all the authors. Further information on author ethnicity/affiliation was obtained from clinical contacts and researchers in the Pacific Islands. A third reviewer (FS) randomly checked 20% of PIFC papers for the authors' ethnicity or affiliation. There was no attempt made to appraise the external or internal validity nor the quality of the research, as that was not the objective of this review. Information on the type of article was obtained from PubMed and from the abstract.

### **Data coding and analysis**

Some data were coded within the EndNote database, and all were coded and analysed within the Microsoft Excel® spreadsheet. The outcomes reported included number of papers, type of studies, names of journals, year of publication, names of authors for both the Pacific and NZ databases and the ethnicity/affiliation details of authors for the Pacific database only. Grading of publication output by country was compared with the SCImago world ranking (1996–2000) for all papers in Medicine.<sup>15</sup> SCImago uses the SCOPUS database listings using a journals prestige and citation analysis and translates it to a country's scientific productivity and impact. A Chi-squared test was performed using IBM SPSS Statistics V20 to test for an association between the PIFC and NZ publication numbers over the 12 years of the study.

## **Results**

The Kappa scores were calculated to measure the degree of agreement between the two researchers for reliability in article selection. The Kappa was equal to 0.97 (SE = 0.01) CI 95 (0.95–0.99). The strength of agreement was considered to be very good.

### **Quantity and types of papers**

There were 174 PIFC papers published during the 12-year study period of which 125 (71.8%) were observational, 24 (13.8%) were opinion pieces, 15 (8.6%) were surveys, 4 (2.3%) were qualitative, 3 (1.7%) were randomised controlled trials and a similar number were review articles. In comparison, NZ had 628 papers of which 223 (35.5%) were observational, 148 (23.6%) were reviews, 141 (22.5%) were opinion pieces, 70 (11.0%) were surveys, 37 (5.9%) were qualitative and 9 (1.6%) were randomised controlled studies.

### **PIFC ranking by numbers of papers published**

Most of the PIFC papers were on PNG participants and populations (Table 1). Approximately 30% of the PNG publication output was from the PNG Institute of Medical Research which received dedicated funding as a statutory body of government and funding contracts from Australian Aid.<sup>18</sup> Collaborations with Australian researchers and a sizeable contribution from the University of PNG also contributed to PNG's 99 papers (57% of all the PIFC papers), although 40% of those did not have a PNG author.

Ranking research output by population size indicated that Samoa had the highest output followed by Vanuatu and Tonga (Table 1) Of Samoa's 19 papers, 11 did not have Samoan authors including all six papers on the topic of transgender males. Of Vanuatu's 15 papers, 10 were without Vanuatu authors and six of the papers were on sexually transmitted infections and sexual behaviour. Of Tonga's six papers, four had no Tongan authors and two were opinion pieces.

There were five PIFC from whom no publications were identified during the 2000–2011 period.

### **Annual frequency of publications**

The percentage increase in the number of publications in the second half of the study period showed a 16% increase for PIFC and 35% for NZ ( $P = 0.24$ ).

### **Journals**

The PIFC papers were published in 95 different journals with 25% of articles published in the Papua New Guinea Medical Journal (PNGMJ) and the PHD. The NZ articles were published in a total of 196 different journals with 29% of them published in the NZ Medical Journal (NZMJ) and the Australian and New Zealand Journal of Obstetrics and Gynaecology (ANZJOG).

Of the 174 PIFC papers, 7 (4%) were published in nursing or midwifery journals. A similar proportion of NZ's 628 papers, (24, 4%) was published in similar journals.

### Authorship of Pacific papers

Of the 174 Pacific papers, 52 (30%) were sole-authored papers and 122 (70%) were multi-authored. Three of the sole-authored papers had anonymous authors, and these were opinion pieces. Of the 49 papers with known sole-authored papers, 8 (16%) were by a Pacific author (Table 2). Of the 122 multi-authored papers, 19 (16%) of the first authors were of Pacific ethnicity.

The 174 PIFC papers had a total of 686 authors. There were 236 (35%) Australian authors, and they authored 15 (31%) sole papers, 51 (42%) first and 170 (33%) of second and latter authors. PNG contributed 170 (25%) authors, and they authored 5 (10%) sole-authored papers, 13 (11%) first authors and 152 (30%) of second and latter authors. There were 65 (10%) authors from the United States of America (USA) and 26 (4%) from Fiji.

Two of the three randomised controlled studies in the Pacific were performed on cervical and breast screening programs in Samoa led by an American team with no Samoan authors, whereas the third was performed in PNG on vacuum extraction instruments led by a PNG team.

### Discussion

The number of reproductive health papers published in the PIFCs countries is low compared with NZ, where PNG had the highest number of papers followed by

Samoa and Vanuatu (Table 1). PNG has the highest ranking among the PIFC by the SCImago World Ranking<sup>15</sup> and its higher research output was driven by the PNG medical research institute (PNGMRI) and partly by the University of PNG underpinned mostly by collaborations with Australian researchers and universities.

Research collaborations between developed and developing countries have contributed to increased health research in PNG as resources and expertise are leveraged<sup>19–21</sup> and have been encouraged as a sustainable way of developing research activity and capacity in developing countries such as those in the Pacific.<sup>9,22</sup> However, collaborations will only work well when there are strong partners in developing countries and where there is evidence of local commitment to health research. By elevating the PNGMRI to a statutory body of the PNG government, a clear signal was sent to researchers and funders that the PNG government values and supports health research.

The five PIFC without a reproductive health paper have in common smaller populations, ranging from Niue with 1300 people to Palau with 20 900. Small countries lack the critical mass and scale and would not achieve similar outcomes to the others.<sup>23</sup>

Samoa's research output, however, was driven mostly by curiosity research conducted by American researchers, and most of the papers did not have local authors. This type of research has been criticised as scientific exploitation where overseas researchers fail to develop local research capacity and take the data for their own use without benefiting the local communities where the research was conducted.<sup>24</sup> A similar review of health research publications from Fiji found that, of the 298 papers published from 1965 to 2002, only 96 (32%) of the publications had a Fijian author, and only one of 9 (11%) reproductive health papers had a Fijian author.<sup>10</sup> Research systems and capability in the PIFC, which includes ethics processes, are still not robust enough, although the larger countries have made attempts to strengthen these. An important principle for researchers, ethics committees and research funders should be to focus on research that will 'make a difference', and this important principle is protected, in part, by building local research capacity that engages local researchers, clinicians and policy makers.

Our findings suggest that Australia is a major funder of research in the Pacific<sup>25</sup> and that Australian clinicians and researchers have good access to PIFC and populations through service work. Most of Australia's development assistance of more than \$1.2 billion annually in the Pacific region is directed to the Melanesian countries, which explains the pattern for Australian research dominance in that part of the Pacific region. From our data, the USA authors seem to have more research connections to the Polynesian and Micronesian states.

There is some evidence that political instability in the region such as the coup d'états in Fiji may have affected

**Table 2** Authorship ranking by country of ethnicity/affiliation

Country	Sole	First of two or more	Second or later	Total for country (% overall authors)
PNG	5	13	152	170 (25.0)
Fiji	1	4	21	26 (3.8)
Solomon Is	0	0	11	11 (1.6)
Samoa	1	1	6	8 (1.2)
Vanuatu	0	0	7	7 (1.0)
Kiribati	0	1	3	4 (0.6)
Tonga	1	0	2	3 (0.4)
Micronesia	0	0	1	1 (0.1)
Total PIFC	8	19	203	230 (34.0)
Australia	15	51	170	236 (34.0)
Other/Non-Pacific	10	10	51	71 (11.0)
USA	7	20	38	65 (9.5)
Canada	5	6	13	24 (3.5)
Britain	1	6	14	21 (3.1)
NZ	3	4	13	20 (2.9)
France	0	0	10	10 (1.5)
Unknown	3	0	0	3 (0.4)
Total non-PIFC	41	103	309	453 (66.0)
Overall total	52	122	512	686 (100)

NZ, New Zealand; PIFC, Pacific Island forum countries; PNG, Papua New Guinea.



the research output in that country.<sup>10</sup> The percentage of observational studies was higher in the PIFC compared with NZ, but the percentage of opinion pieces and reviews was lower than NZ. Where there is a shortage of clinicians, writing and research work is not considered a priority.<sup>26</sup>

Non-PIFC researchers tended to publish in globally recognised journals, which are rarely read by local clinicians. Nearly, all the papers published in the PNG Medical Journal and the PHD have a PIFC author or the findings were highly specific to the local area. There is an argument for increasing the capacity of local publications to publish local research as an important component of capacity building.<sup>27</sup> However, there is a counter-argument that local journals do not contribute to a country's citation index and that global journals should instead offer a service to assist local researchers upgrade their work to meet their standards.<sup>28</sup>

We recommend that research activity and capacity in the PIFC should be strengthened to aid national and regional development. Well-funded health research institutes, such as the one in PNG, should be created around the region to increase research activity and build a critical mass of researchers. Collaborations with international research teams should be encouraged. However, emphasis should be placed on genuine research partnerships<sup>29</sup> and respecting Pacific cultures<sup>30</sup> as a prerequisite for research approvals in a Pacific Island Forum country.

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