



The medical workforce needs of the Pacific islands, Papua New Guinea (PNG) and East Timor (see map) are vastly different from those of their richer neighbours such as Australia and New Zealand. In these developing nations, 50%–90% of the population live in rural areas (as opposed to 10%–15% in Australia). Their gross national product (GNP) is US\$500–\$2000 per capita, with 2%–5% of gross domestic product (GDP) spent on healthcare (compared with Australia's \$20 000 per capita, with 9.7% of GDP spent on healthcare). In Australia and New Zealand, there are about 2–2.5 doctors per 1000 population, while, in the Pacific, the ratios are about 20 times less, at 0.1–0.4. The age distribution of the population is also very different: 30%–40% of people are aged less than 15 years and only 5% are over 60 (compared with 20% under 15 years and 15% over 60 in Australia).

The health of Pacific islanders is poor when defined according to standard indicators such as life expectancy at birth, infant and under-5 mortality, and maternal mortality (Box 1). The low ratio of doctors, nurses and other healthcare workers to the total population is unlikely to improve rapidly because of the lack of capacity for training.

Today's workforce

The current medical workforce in the Pacific region is made up of doctors who have been trained in a variety of ways:

- Locally trained graduates of Bachelor of Medicine and Bachelor of Surgery (MBBS) courses from the University of Papua New

Guinea (UPNG) and the Fiji School of Medicine (FSM). Some of these doctors have also trained as specialists through local or overseas postgraduate training programs (see Kevau et al, page 608).^{1,2}

- Graduates from the Pacific Basin Medical Officers Training Programme (PBMOTP), which was run by the University of Hawaii in the Federated States of Micronesia from 1986 to 1996 (Box 2). The program trained 50 medical officers from Micronesia and 20 from Belau, the Marshall Islands and American Samoa. Most are now working in their own countries in the North Pacific region.
- Doctors from Pacific island countries who are employed in neighbouring countries on contracts that attract better remuneration, if not better hospital facilities, than that of their home country.
- Doctors from Europe, the Indian subcontinent, South-East Asia, or Australasia. Some are volunteers, some are associated with non-government organisations, and some are salaried members of the departments of health or universities in the countries in which they work. A small number are funded by overseas aid programs (eg, in East Timor). These doctors were the main providers of medical care until local training programs began. A handful have stayed on in specialties (eg, radiology, pathology) in which local trainees have not yet filled all the available posts or in remote hospitals funded by overseas aid or missions.
- Doctors from countries such as Cuba and China who have been sent to work in Pacific countries as a result of government-to-government discussions, but with little consultation with specialists in the Pacific region (local or expatriate). (This has occurred in East Timor and PNG.)

The medical workforce in any Pacific island country represents a variety of attitudes and cultures as a result of doctors' different backgrounds and training. For example, in Micronesia, there are 50 PBMOTP graduates with diplomas, six graduates with an MBBS from PNG or Fiji, and one with an MD from the United States (John Hedson, Chief Surgeon, Micronesia, personal communication). Knowledge and professional attitudes vary, despite the government classifying all doctors in the same way.

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1 Population and health statistics for Australia, New Zealand, Papua New Guinea, East Timor and the Pacific islands*

Country	Population	Life expectancy at birth (years)	IMR [†]	Under-5 mortality rate [‡]	MMR [§] /100 000 live births	Doctors per 100 000 population	Proportion of GDP spending on health (%)	Spending per capita on health (US\$)	GNP per capita (US\$)
Australia	20M	79	6	6	8	250	9.2	1741	19860
New Zealand	3.8M	78	6	6	7	220	8.3	1073	13280
Papua New Guinea	5.1M	54	73	102	370	7	2.3	27	580
Fiji	800000	67	19	23	27	52	3.5	55	2080
Solomon Islands	430000	63	22	26	549	11	11.6	11	610
Samoa	175000	68	22	27	70	38	5.8	91	1440
Tonga	100000	71	19	23	197	46	3.5	56	1410
Vanuatu	200000	61	38	49	68	10	2.5	29	1110
Kiribati	93000	63	54	74	225	15	12.7	94	980
Marshall Islands	53000	66	63	92	na	43	4.6	85	2270
Micronesia	120000	68	20	34	226	46	9.1	171	1960
East Timor	850 000	na	88	124	600	4	5.9	25	440

* Sources: World Bank, UNICEF, World Health Organization. † IMR (infant mortality rate) = number of infant deaths per 1000 live births. ‡ Number of deaths in children under 5 years per 1000 live births. § MMR = maternal mortality rate. GDP = gross domestic product. GNP = gross national product. na = data not available.

There is reasonable mobility of specialists around the Pacific. For example, the Marshall Islands, Tonga, the Cook Islands and Fiji have all employed surgeons trained in PNG in recent years. Thirty per cent of doctors in Fiji are expatriates, as a result of the high attrition rate of local doctors — in the past 5 years, 40% of Fijian graduates have gone into private practice or left Fiji.

Many Fijian doctors have gone to Australia or New Zealand, their residencies being supported by citing an “area of need”. As Australia is short of junior doctors and of doctors willing to work in rural and remote areas, governments and departments of health are only too happy to recruit well qualified overseas doctors to fill the local void, regardless of it being a case of “the rich robbing the poor” (see Baravilala and Moulds, *page 602*).⁵

Once these doctors leave their countries it is always difficult to return home. Medical salaries in the Pacific nations are not competitive with those in Australia and New Zealand (eg, the salary of a PNG doctor is about A\$13 000–\$30 000 a year). The longer a doctor spends working and training overseas, the harder it is to uproot the family, particularly if children are already estab-

lished in school. There is, for example, no international school in the Solomon Islands. The first UPNG national graduate (Professor Sir Isi Kevau), who trained as a cardiologist and gained Fellowship of the Royal Australasian College of Physicians, has recently been knighted in recognition of his contribution to local medical school training and healthcare in PNG and for his sacrifice in making the decision to return home after living for some years in Sydney.

Training the workforce

Undergraduate training

Fiji, the Pacific islands and PNG

The predecessor of the FSM was founded in 1885.⁶ Until 1960, it was the only institution in the Pacific training doctors. Between 1951 and 1964, it also trained 16 national doctors for PNG before the Papuan Medical College was started in 1962 (see Kevau et al, *page 608*).¹ Since the founding of its medical school in 1968, the UPNG has produced over 700 doctors, including 100 Pacific islanders and 50 expatriates. The attrition rate from the public service is about 50%.⁷ (Most of the doctors who leave the public

2 Pacific Basin Medical Officers Training Program

The Pacific Basin Medical Officers Training Program (PBMOTP) was a 10-year program (1986–1996) funded by US government aid and run by the University of Hawaii. It introduced an experimental 5-year problem-based learning course, with the first 3 years being spent in rural areas and community health clinics and the last 2 years being spent in urban hospitals. The program, which ran for a strict 10-year period because funding was limited, produced 70 doctors, 50 of whom were from the Federated States of Micronesia.^{3,4} These doctors had practical public health and clinical skills, but not as deep a knowledge of basic medical sciences and pathology as a graduate of the University of Papua New Guinea or the Fiji School of Medicine. Their degree would not be recognised in Australasia or the United States as an MBBS or MD equivalent. However, it is recognised for entry into postgraduate programs in Fiji.

Scenario 1

Dr A did a 4-year specialist training program, one year of which was spent in Australia on a scholarship. His performance was impressive and his supervisors felt sorry for him having to return home to shortages, poor remuneration and fewer educational opportunities for his children. The consultants arranged a paid position and recommended he stay to study for a “Fellowship of the Royal College” — in their minds, a “real” qualification — rather than his MMed, a degree they knew little about. Dr A was smart and hardworking. After 4 years he gained his Fellowship, but by then he was more comfortable practising in Australia. He never returned home. His children were well educated and became Australians.

3 Specialist surgical aid program in East Timor

East Timor, a small country with a population of 850 000, is among the 10 poorest nations in the world (Box 1). It receives considerable support from donor countries such as the United States, Japan, Australia and Portugal. East Timor had an organised health service similar to that of the rest of Indonesia before the independence vote in 2000. After independence, East Timor had to rebuild its health service after almost all health infrastructure and records had been destroyed and experienced doctors had departed.

Hospital services were reactivated in 2000 in the capital, Dili, by the International Committee of the Red Cross and in Bacau by Médecins Sans Frontières. These programs ended in mid-2001. Since then, the running of the national referral hospital in Dili has been assisted by Healthnet (formerly CORDAid), a non-government organisation. Specialist staff in the major disciplines of surgery, anaesthesia, obstetrics, paediatrics and internal medicine have been recruited by the East Timor Department of Health, Healthnet and an AusAid program managed by the Royal Australasian College of Surgeons (RACS). The RACS program is based primarily in Dili and provides a resident surgeon and anaesthetist and visiting specialty teams. Each month, a specialist surgical team comes to undertake procedures not normally performed by the resident general surgeon. Cases are selected on the basis of requiring specialist skills and having a chance of success in a situation of limited postoperative care and follow-up. Such cases include cataract removal by ophthalmology teams and repairs of cleft lip and palate by plastic surgery teams. Paediatric surgery teams have repaired imperforate anus in a number of children who previously had only a colostomy performed at birth. Visiting cardiac surgery teams have, to date, undertaken patent ductus repairs but not open heart surgery, even though rheumatic fever, with subsequent rheumatic heart disease and congenital heart disease, is common. Common procedures performed by visiting urologists are removal of bladder stones, prostatectomy, and repair of urethral strictures. Orthopaedic teams are involved in managing congenital disease (eg, club foot) and malunion or non-union of fractures in trauma victims. Patients with cancer usually present late, staging is based on clinical assessment and plain x-rays, and surgical treatment is limited. There are currently no East Timorese surgical specialists. The future specialist workforce in East Timor will be made up of a hotch-potch of graduates from training programs in a variety of countries. Part of the RACS program is to assist in developing specialist skills in-country. To obtain recognition of their specialist training, three East Timorese doctors are starting surgical training in the UPNG program (two in general surgery and one in ophthalmology). Other East Timorese doctors have gone to other countries, including the Philippines and Portugal, for postgraduate training.

service take up private or general practice or go to neighbouring Pacific countries. Some go into administration or politics.)

The FSM commenced a 6-year MBBS course in 1982. The FSM is the principal medical school for the Pacific islands, and both undergraduate and postgraduate programs include a number of Pacific islanders. Together, the UPNG and the FSM have the capacity to produce about 120 doctors a year. In both institutions, courses based on problem-based learning have been adopted (see Duke, *page 612*).^{1,2,8}

The majority of doctors working in the Pacific have been trained in the Pacific. However, the capacity of these countries to increase the medical workforce and improve doctor-to-population ratios is limited. There are not enough places in the two medical schools in the region and insufficient funds to recruit large numbers of doctors from elsewhere.



Anaesthetics in East Timor are mostly given by nurse anaesthetists. Australian anaesthetists have developed an appropriate 1-year program for nurses that includes a 3-month rotation to an anaesthetic teaching department in Indonesia. Perioperative theatre nurse education has been incorporated into this program, and two primary trauma-care courses using Indonesian-speaking doctors have been successfully conducted.

The challenge in training the workforce in East Timor is to develop skills appropriate for the facilities available, the local disease mix, and health budgets for the foreseeable future. It has been an important policy direction for Ministry of Health planners to design a health service that is sustainable in the medium to long term with the level of expenditure likely to be available from their own resources and firm donor country commitment.

These good intentions can be overwhelmed from time to time when some overseas aid teams arrive without the necessary language skills or interpreters and with minimal financial resources to provide the technical supplies they consume in the hospitals.

The concept of specialist surgical aid programs providing tertiary care has been questioned as an appropriate priority in countries with underdeveloped health services. The conventional argument is that money would be better spent on clean water, vaccination programs and village-based health centres that deliver simple, effective services.

We agree that supporting primary health services is important. Nevertheless, the community also gains from access to acute hospital care for common problems such as trauma, acute infections and obstructed labour. Relatively simple surgery requiring short hospital stays can restore patients to normal health and prevent much disability. Beyond this, tertiary surgical services — again with simple surgery and short stay for conditions such as cleft lip and palate in the young and blindness due to cataract in the elderly — can restore large numbers of patients to active and economic participation in their communities. The statistics from our visiting teams support this view.



The intensive care unit at Dili National Hospital (courtesy of Carolyn Beckett)

Scenario 2

Dr B had the same experience as Dr A, but did return home. It was a difficult decision for him and his family after gaining his Fellowship. But he re-established himself back home, sent his children to the government school, was gradually promoted through the ranks of the local medical school and became an academic, one of the country's leading doctors, and an inspiration to young national doctors.

Although the number of graduates is about half what is required, the available staffing and resources are stretched enough as it is and would be unlikely to be able to train more at today's standard.

Workforce and training in East Timor

East Timorese doctors have been trained in Indonesian medical schools. After the vote for independence in 2000, the country's infrastructure was destroyed by the departing Indonesians, although the hospitals were not damaged. There are currently 46 qualified East Timorese doctors, but only 23 are working for the government, with just 17 in clinical work. There are no practising local specialists. Non-government organisations staff some of the hospitals and health facilities in the provinces. Specialist care in East Timor is provided by a few doctors whose positions are funded by the Department of Health or by aid projects, such as those managed by the Royal Australasian College of Surgeons (RACS) and HealthNet (a Dutch non-government organisation, formerly CORDAid). The service provided is supplemented by visiting specialist teams (Box 3) (see Beckett, page 603).⁹

Postgraduate and specialist training

Some of the benefits of running a local postgraduate program are that doctors-in-training work for most of the time in their own country, learn to diagnose and treat disease with the resources available, and are less likely to leave once qualified. Before the commencement of a local Master of Medicine (MMed) program in Fiji in 1997, only five of the 56 doctors who went overseas for specialist training returned. This led the FSM to believe it was training doctors for Australia and New Zealand! By contrast, local training, using external examiners, has been shown to encourage retention of doctors in the Pacific region, while still achieving a high standard.

The main means of specialist training in both PNG and Fiji is university-run 4-year MMed courses. Both countries offer 1-year diploma courses in child health, obstetrics and gynaecology, and anaesthesia. Fiji also offers a surgery and medical diploma, while PNG offers a diploma in ophthalmology. Passage to the MMed course depends on a good grade at diploma level. Diplomates

would be expected to be able to provide safe care in a rural district or provincial hospital.

Since its inception in 1975, the MMed program at the UPNG has trained 132 specialists in medicine, surgery, child health, obstetrics and gynaecology, psychiatry, ear nose and throat, and ophthalmology (see Kevau et al, page 608).¹ The program has successfully trained specialists from the Solomon Islands and Micronesia.

In Fiji, diploma courses and MMed training were begun in 1997, with the first MMed students graduating in 2001. By the end of 2003, 74 diplomas had been awarded by the FSM (in anaesthesia, internal medicine, obstetrics and gynaecology, paediatrics, surgery, community and hospital practice), and 17 candidates had completed the MMed degree (in anaesthesia, internal medicine, obstetrics and gynaecology, paediatrics, and surgery). Of these graduates, 68 diplomates and 12 masters graduates were practising in Pacific island countries.²

About 10 medical officers trained under the PBMOTP have done a year of further training at the FSM to obtain a specialist diploma. A handful of these doctors have undergone further specialist training.⁴

Scenario 4

Dr D was a promising young specialist who, with the support of Australian aid, spent a year of training in Australia during his MMed course. This gave him a rewarding year of training and also provided him with a network of contacts and a desire to seek better remuneration. He finished his training back home and worked for a year as a specialist. Citing "area of need", he was appointed to a general practice position in a remote hospital in Australia, and to this day works as a GP rather than in the specialty for which he was trained by his home country.

Subspecialty training

During the 1990s, PNG saw the need to train some of its general surgeons in surgical subspecialties. In 1994, programs in orthopaedic surgery, head and neck surgery and urology were started, with paediatrics and neurosurgery later added. These programs involve both in-country and overseas training for 2–3 years after obtaining an MMed and working as a general surgeon. Specialty associations in Australia have provided the trainers and hospital positions to support the program.¹⁰

A similar model was used to train orthopaedic surgeons in both Fiji and the Solomon islands through the support of Orthopaedic Outreach and the Australian Orthopaedic Association. Fiji's experience of the specialist "brain drain" has led it to favour the PNG model of establishing a local subspecialty program rather than risk losing further specialists to Australia and New Zealand.

Scenario 3

Dr C was one of the first to graduate as a subspecialist. After working for a year on a low wage and feeling frustrated by constant shortages of essential items and equipment, she decided to go into private practice. For 2 years she continued to do some private specialty procedures, but gradually became less confident. She was not aware of the latest advances in her specialty and could not afford to attend overseas meetings. Ten years after graduating as a specialist, Dr C did only general practice. Her children were all well educated at private schools, but she never felt fulfilled. The local Department of Health felt resentful of the wasted investment in Dr C's training.

Complementing specialist and tertiary health services

Visiting specialist teams

Despite the improving standards of local specialists in the Pacific region, there is still a need to complement their skills and capabilities with the skills of visiting specialists. Teams visit one or two centres over a 2-week period, performing procedures on cases selected by the local doctor or specialist. Interplast,¹¹ eye assessment and surgery teams,¹² the Australian Orthopaedic Association and Orthopaedic Outreach have been performing this sort of work for some decades. In 1995, a Pacific Island Project was developed

by the RACS to formalise Australian government support for visiting surgical teams.¹³ A similar program in PNG is the PNG Tertiary Health Services Program.^{7,10} The visiting teams treat patients using specialist equipment and expertise and pass on skills to local practitioners. They may also support local training programs. For example, a neurosurgeon on a 2-week visit may give undergraduate lectures and postgraduate teaching in neurosurgery course modules in addition to treating cases and handing on skills to a local subspecialty trainee.^{14,15}

Sending selected patients overseas

The work of visiting cardiac teams led by Alan Gale and others has produced good outcomes in PNG and the Pacific. It has also resulted in improved nursing skills in intensive care.^{16,17} Although there are as yet no PNG or Pacific cardiac surgeons, much of the closed cardiac surgery is done by local surgeons during cardiac-team visits.¹⁰

The funding available to send a small selection of patients overseas is limited. NZAid provides some funding for certain Pacific island countries. Rotary Overseas Medical Aid for Children and other groups arrange hospital care in Australia and New Zealand on a case-by-case basis. Although patients treated overseas derive benefit because they are usually selected on the grounds of being curable, the cost of treating one patient is often equivalent to the cost of bringing in a visiting specialist team for 2 weeks, who might consult on 50 patients and operate on 25.

Using the Pacific workforce to provide specialist care

Doctors and specialists in Fiji, PNG and the Pacific are well trained and already provide a broad range of services.⁹ Their abilities are limited only by lack of resources and supporting infrastructure. However, the remoteness of much of the population and the large number of patients mean that, in practice, their skills are only accessible to a small proportion of the population.

The development of subspecialist training has enabled specialists in the Pacific to manage more complex conditions. A shining example of this is the development of paediatric surgery in PNG, where two surgeons, trained thanks to the enthusiasm of Paddy Dewan (Paediatric Surgery Coordinator, PNG Tertiary Health Services and Pacific Island Projects) and others, are now able to competently manage anorectal and other congenital anomalies. They make visits around PNG to perform specialist procedures, and earlier this year one also headed an RACS AusAid-funded team that visited the Solomon Islands. Two PNG-based specialists also made visits to Nauru to treat asylum seekers.

As capabilities develop, Pacific island specialists will be the real experts in providing specialist care in their own countries. Aid programs will need to support them with the consumables and equipment necessary to use the skills with which they have been



Surgical MMed graduates from UPNG in 1999. From left: Simon Mete, Director of Medical Services Port Moresby General Hospital; Okti Poki, who qualified as Higher Surgical Diplomate in Paediatric Surgery 2004 after 2 years of training in Australia; Dudley Ba'aerodo, the surgeon on Malaita, Solomon Islands, who now has an RACS Rowan Nicks scholarship to train in urology; Lister Lun, surgeon on Manus, who also performs cardiothoracic surgery with visiting cardiac teams.

trained (usually with the help of AusAid funding). Future visiting teams will include specialists from PNG and the Pacific islands, as well as more narrowly trained Australasian specialists. However, as there will be a manpower shortage for decades, Pacific-based specialists will be limited in how much specialist care they can provide elsewhere. Visiting teams will comprise mainly Australian and New Zealand specialists for some time to come.

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Scenario 5

Dr E was a trained specialist providing a high standard of care until his marriage started to disintegrate. There was an acrimonious divorce and some violence. He was suspended from practice in the public health system and this resulted in many patients receiving suboptimal care until his case was heard and he was reinstated. It took over 2 years and the retirement of some opponents before he was reinstated and able to treat public patients. Although he was able to provide some specialist care in private practice, the majority of patients in need could not gain access to him.