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Evaluation of **Visual Impairment Activities in Pacific Island Countries**

Henry and his grandaughter Jenny. Henry has been treated by the visiting eye team at Kirakira Hospital, Solomon Islands. Credit: Kristian Frires, Fred Hollows

ALLEN+CLARKE

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Contents

Abstract

The purpose of this evaluation is to provide information to inform decision making around future New Zealand Aid Programme support for visual impairment activities in the Pacific. The evaluation focused on support provided by MFAT over 2006 to 2015, and also considered support provided by other donors and development partners, as well as visual impairment activities led by Pacific governments. It analysed the relevance, impact and sustainability of these activities, and made recommendations to inform future directions. The evaluation involved a contextual review of the eye disease burden and health system response, and interviews with 62 stakeholders in New Zealand, Australia and seven Pacific countries.

The evaluation found that the need for visual impairment services remains high and is compounded by a growing and ageing population, and the growing incidence and prevalence of NCDs. The health system response is multi-faceted and found to be high performing and providing the missing ingredients of successful system functioning. MFAT and its main implementing partner, Fred Hollows Foundation New Zealand, are critical actors in this system response.

The evaluation concluded that support for visual impairment activities is a priority when it has wider system impacts, beyond ophthalmology. As a long term investment, MFAT's support has had positive impacts across workforce training and support, service delivery and leadership. The system that has been built is largely led and coordinated from outside national departments/ministries of health, and from outside of the countries themselves. It is very reliant on donor support. The evaluation concluded that if eye health activities are to be sustainable, they need to be better integrated into country systems before donor funding can be withdrawn.

Executive Summary

Background

This report presents the findings of an evaluation of visual impairment activities in the Pacific. It focuses on visual impairment activities supported by the Ministry of Foreign Affairs and Trade (MFAT) through its New Zealand Aid Programme, including the long term investment under the Pacific Regional Blindness Prevention Programme (PRBPP). It also considers activities delivered by Pacific Island governments and those supported through other donors and development partners. The evaluation comes at a time when MFAT's third phase of support for the PRBPP is coming to an end and when the Aid Programme has a new strategic plan and investment priorities.

Evaluation purpose, questions and methods

The purpose of the evaluation is to:

- Provide a situational review of visual impairment activities in the Pacific.
- Inform decision making around future investment in visual impairment activities, based on an assessment of need and where New Zealand can most add value.
- Improve the design, management and implementation of any future activities that contribute to reducing visual impairment in the Pacific.

The evaluation addresses four key evaluation questions which relate to relevance, impact, sustainability and future direction. The questions are:

1. To what extent is addressing visual impairment a priority for the Pacific and for the New Zealand Aid Programme? (Relevance)
2. What difference have visual impairment activities made? (Impact)
3. To what extent are the activities and their benefits likely to continue? (Sustainability)
4. What should MFAT do to support improved eye health outcomes? (Future direction)

The evaluation findings are based on information collected through: a review of key documents, including MFAT activity documents, progress reports from MFAT's main implementing partner, Fred Hollows Foundation New Zealand (FHFNZ), and research literature; analysis of health service delivery data; interviews with 17 representatives of key stakeholder organisations; interviews with 42 stakeholders during visits to Fiji, Papua New Guinea (PNG) and the Solomon Islands; telephone interviews 5 stakeholders in Kiribati, Tonga, Samoa and Vanuatu; and a workshop with representatives from MFAT and FHFNZ. Information was collected over August to November 2015.

Findings, conclusions and recommendations

To what extent is addressing visual impairment a priority for the Pacific and for the New Zealand Aid Programme?

Visual impairment is not a major contributor to the burden of disease in the Pacific; directly responsible for few deaths, and a small portion (around 6%) of the disease burden as expressed by DALYs (disability-adjusted life years). There is, nevertheless, a high need for visual impairment services in the Pacific, and the ageing population and the growing incidence and prevalence of diabetes means this demand is likely to remain high for some time.

There are a range of visual impairment service responses, particularly focused on the provision of services, providing workforce training and support, providing medical supplies and equipment and leadership development. MFAT and DFAT are the main donors supporting visual impairment activity, and FHFNZ is the main development partner at a regional level and is also a significant funder. Pacific Island governments are involved in the planning and delivery of visual impairment activities, with varying degrees of ownership. Their level of investment in visual impairment activities does not suggest it is a priority on its own; however, this is relative to other significant health priorities.

Visual impairment activities are relevant to the Aid Programme's new strategic investment priorities, largely as an entry point into addressing diabetes which aligns with a priority around reducing the impact of non-communicable diseases (NCDs). As an organisation with significant expertise in visual impairment, partnering with FHFNZ is an effective way of drawing on New Zealand's strengths. Taking what is one relatively narrow slice of health care (eye health) and addressing multiple facets of the eye health system at a regional level, could be seen as an appropriate role for New Zealand in the Pacific. It does enable Pacific governments to focus on other priorities.

The focus of MFAT's investments in visual impairment remains relevant in terms of addressing an ongoing need for services and in building workforce capability and capacity. The nature of the problem is changing though, and addressing needs associated with the unprecedented levels of conditions such as diabetes will require an approach that is more integrated with other parts of the health system.

The evaluation found that MFAT's support is not always well-aligned with aid effectiveness principles, and in particularly needs to be better aligned with recipient country systems (e.g. financial and reporting systems).

The evaluation concludes that, when it has wider system impacts, the New Zealand Aid Programme can clearly justify addressing visual impairment as a priority. The challenge, therefore, is how to extend this very successful investment in eye health to other parts of the system. How to bring a wider set of results, beyond ophthalmology, but without risking what's been achieved to date.

What difference have visual impairment activities made?

MFAT, in partnership with FHFNZ, has been investing in visual impairment activities in the Pacific for a considerable period of time. The result is a multi-faceted response to lifting standards, capacity and performance of eye health services across multiple countries. These achievements extend across workforce training, service delivery, workforce support, provision of supplies and consumables, and leadership. Such a multi-dimensional approach is rare in these settings and its achievements need to be considered within a context of poor health system functioning in the Pacific more generally.

Activity monitoring data on workforce training and service delivery show that more than 200 eye health professionals have been trained through MFAT's investment, and around 35,000 eye consultations completed per year. Beyond this, and perhaps from where the real difference will be made, the visual impairment activities, including those supported by MFAT, are directly providing the missing ingredients of successful system functioning. For effective eye health service functioning, these include the creation of a supportive network of relationships, supervisions, supplies, training, quality systems and collegiality.

Critically, the activities have not had the same impact everywhere. Progress has been greater in countries where there has been sustained and strong leadership in eye health and where governments have taken greater ownership (e.g. Solomon Islands, as evidenced by an eye team in the Ministry of Health and Medical Services, the existing of an endorsed national eye plan and a budget line for eye services). Conversely, progress in other countries has been slower due to weaker government ownership (e.g. PNG), or an absence of strong national leadership for eye health (e.g. Vanuatu). PNG is a special case, due largely to the size of its population relative to the rest of the Pacific. MFAT's activities have yet to achieve the same level of reach in PNG as they have elsewhere. The workforce shortages in PNG, particularly for ophthalmologists, are particularly acute.

To what extent are the activities and their benefits likely to continue?

Despite the strong progress, the evaluation found that the need for visual impairment services remains high and that an ageing population and the NCD epidemic will be key determinants of future need. To date, the system response to this need has been largely led and coordinated from outside the national departments/ministries of health, and from outside of the countries themselves, and this has created a significant level of dependency on external partners. In the absence of continued donor support, many of the activities supported through MFAT and FHFNZ would be at risk of failing and the status of eye health in many countries would likely deteriorate.

The activities have clearly had a benefit in building local, indigenous capacity and capability (e.g. the >200 trained personnel). However, in terms of integration and alignment with local systems, a key determinant of sustainability, the evaluation found that many donor-supported eye health activities are not 'on plan' in terms of formally endorsed by government in a national plan or strategy; are rarely 'on budget' in terms of costed in country budget frameworks; or 'on report' in terms of captured within national health information system indicators.

The evaluation concludes that the benefits of the activities can be sustained, but that this will require a well-managed transition to government over a period of time. Reflecting the variable progress countries have made to date, this transition needs to be tailored to individual countries, accepting some functions will transition to some governments relatively easily (or already have), while the transition of other functions (such as quality systems) and the transition to other governments will take longer.

What should MFAT do to support improved eye health outcomes?

There has been considerable progress and success in the implementation of MFAT's investments in visual impairment activities in the Pacific. The achievements are the result of a long term investment and relationships, and the experience of its implementation partner, FHFNZ, in building many parts of the eye health system, and in particular workforce training and network building across the region. The activities show considerable merit and are making a difference.

In the right set of circumstances, including where there is strong local leadership and country ownership of eye health services, the need for ongoing development partner support is reducing. In other circumstances, including in regions where the activities and support have had limited reach, there is untapped potential for benefits from future support.

The evaluation makes recommendations for future investments in visual impairment activities and on other New Zealand Aid Programme interventions that have the potential to address visual impairment.

Recommendations:

1. MFAT continue to support visual impairment activities in the Pacific, but with five key changes (recommendations 2–6).
2. In delivering future activities, MFAT give greater focus to ensuring the transition of activities to Pacific governments and local systems.
3. Extend the reach of MFAT's support, particularly for training and workforce support, supervision and quality systems, targeting providers and parts of the region that are not currently part of the network that FHFNZ has built (with a focus on PNG).
4. In Fiji, encourage and support the government to strengthen national leadership and coordination for eye health, and ensure equitable access to services across all divisions.
5. Grow the REC in the Solomon Islands into a truly regional facility that has benefits outside of Honiara and is an asset and exemplar for other parts of the health system.
6. Continue to focus on strengthening the provision of comprehensive eye care services, including surgical treatments, general eye care and refractive services.
7. MFAT consider supporting credible epidemiological approaches to measuring the prevalence and causes of visual impairment in the Pacific, and to modelling of responses to future demand.
8. Establish approaches to addressing diabetes retinopathy that are integrated with chronic care management responses to NCDs.

9. MFAT consider the potential to support the development and use of information systems for enhancing health service delivery, and in particular for enabling continuity and comprehensive care as part of chronic care management.

1 Background

This section provides some context for MFAT's interest in visual impairment[1] activities in the Pacific, and provides information on the purpose of this evaluation, its associated methodology and an overview of the structure of this report.

1.1 Context

MFAT, through its New Zealand Aid Programme, has supported activities designed to tackle visual impairment in Pacific Island countries since around 2002. This includes:

- Three phases of the Pacific Regional Blindness Prevention Programme (PRBPP) delivered in partnership with the FHFNZ and funded by the New Zealand Aid Programme ($13.7m)[2] and the Australian Department of Foreign Affairs and Trade (DFAT, $14.2m). Since 2006 the PRBPP has focused on education/training, service delivery (a substantial component which has been cataract surgery), workforce support and health system strengthening.
- The design, construction and initial operation of a Regional Eye Centre (REC) in the Solomon Islands, again in partnership with the FHFNZ. MFAT invested $4.1m in the REC which opened in July 2015.

MFAT also funds the New Zealand Medical Treatment Scheme (MTS) which covers a wide range of medical conditions, including a small amount of ophthalmological care. The annual cost of this scheme is around $2.9m.

All Pacific Island governments deliver eye care services, including at a sub-national/provincial level. Other donors and development partners are active in supporting visual impairment initiatives in the Pacific, including initiatives that specially target visual impairment, as well as broader medical specialist and systems strengthening programmes that support improved eye health alongside other conditions.

MFAT's current phase of support for the PRBPP ends in December 2015, and the current funding arrangement for the REC ends in July 2016. The most recent phase of support for the MTS ended in August 2015.

Coinciding with the conclusion of MFAT's current funding arrangements, the New Zealand Aid Programme has recently entered a new triennium funding period, 2015/16 to 2017/18, with an increased aid budget and a new plan signalling its strategic intentions. The new *Strategic*

[1] 'Visual impairment' is used throughout this evaluation as a potentially more inclusive term than 'preventable [or avoidable] blindness'. The evaluation takes a broad definition of 'visual impairment' that is inclusive of the ICD-10 definitions of moderate visual impairment, severe visual impairment, and blindness.

[2] Unless otherwise stated, cost in this report are in the New Zealand dollar ($).

Plan 2015–19 provides a framework for investment across 12 priorities, including health. The health investment priority includes four focus areas:

1. Reduce the impact of NCDs by reducing risk factors and increasing access to secondary NCD drugs, technology, and specialist services.
2. Enhance maternal health by increasing access to modern contraception, reproductive health services, and better nutrition for pregnant women.
3. Improve child health by increasing access to routine immunisation, life-saving vaccines, and better nutrition.
4. Increase reliable access to clean water and sanitation services.

Other frameworks that influence the strategic direction of the New Zealand Aid Programme have also recently changed. The new United Nations Sustainable Development Goals (SDGs)[3] include a 'good health and wellbeing' goal with a number of targets relevant to eye health, including reducing mortality from NCDs, achieving universal health coverage (UHC)[4], and increasing health financing and the recruitment, development, training and retention of the health workforce.

In 2013, the World Health Assembly approved a global action plan for universal access to eye health with the aim of achieving a measurable reduction of 25% of avoidable visual impairments by 2019[5]. In line with this plan, in 2013 the WHO Regional Committee for the Western Pacific endorsed a regional action plan that set out recommended actions to: address the need for evidence on visual impairment; encourage the development of national eye health policies, plans and programmes; and address multi-sectoral engagement and promote effective partnerships[6].

Further analysis of the strategic context for visual impairment activities in the Pacific is included in section 2.1 of this report.

1.2 Evaluation purpose

The purpose of the evaluation is to:

- Provide a situational review of visual impairment activities in the Pacific.
- Inform decision making around New Zealand's future investment in visual impairment activities, based on an assessment of need and where New Zealand can most add value.

[3] The SDGs replace the previous Millennium Development Goals (MDGs).

[4] This target covers financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

[5] *Universal Eye Health: A Global Action Plan 2014–2019.*

[6] *Towards Universal Eye Health: A Regional Action Plan for the Western Pacific (2014–2019).*

- Improve the design, management and implementation of any future activities that contribute to reducing visual impairment in the Pacific.

More widely the evaluation is expected to inform FHFNZ's plans for ongoing work in the Pacific, and current decisions within DFAT regarding its future investments in eye health and other specialist services in the Pacific.

1.3 Scope

The evaluation considers the New Zealand Aid Programme's investments in visual impairment activities in the Pacific within a broader strategic context. This includes consideration of the wider context for eye disease burden in the Pacific, the global response to this and the role of the New Zealand Aid Programme within this response. The evaluation is not, therefore, focused on a single activity or programme, and it does build on existing information on the effectiveness and efficiency of relevant New Zealand Aid Programme activities.

The evaluation focuses on visual impairment investments over the past 10 years (2006 to 2015). In situating these within a broader strategic context, the evaluation looks ahead, considering key changes needed in the next three years (over the Aid Programme's next triennium funding period) and over the next 10 years (considering key demographic and other changes which might influence decisions on how New Zealand supports visual impairment).

The evaluation considers the Pacific region but with a particular focus on PNG, Fiji, Solomon Islands, Kiribati, Tonga, Samoa and Vanuatu. The evaluation excludes PRBPP activities in Timor Leste and activities that do not have a specific focus on visual impairment.

1.4 Key evaluation questions

The evaluation addresses four key evaluation questions which relate to relevance, impact, sustainability and future direction. The questions are:

1. To what extent is addressing visual impairment a priority for the Pacific and for the New Zealand Aid Programme? (Relevance)
2. What difference have visual impairment activities made? (Impact)
3. To what extent are the activities and their benefits likely to continue? (Sustainability)
4. What should MFAT do to support improved eye health outcomes? (Future direction)

1.5 Design and methods

The evaluation has three main areas of focus:

1. A contextual review and analysis that focuses on the disease burden and the health system response to visual impairment.

2. Evaluative judgements on the relevance, impact and sustainability of investments aimed at addressing visual impairment, with a focus on New Zealand Aid Programme investments but within a broader context of other investments.
3. A prospective focus that includes recommendations on changes to current investments and on any future investments.

To ensure this evaluation provides accurate and useful findings, a range of methods were used to answer the questions. These included:

- **Document review**, including MFAT activity documents, FHFNZ progress reports, Pacific Island government national health plans and eye health plans, WHO and IAPB reports, and research literature.
- **Analysis of health service delivery and outcome statistics**.
- **Interviews** with representatives of key stakeholder organisations (17 individuals), key stakeholders in Solomon Islands (10 individuals), PNG (15 individuals) and Fiji (17 individuals), and eye health professionals in Kiribati, Tonga, Samoa and Vanuatu (5 individuals).
- **A sense-making workshop** with representatives from MFAT (5 individuals) and FHFNZ (3 individuals).

The stakeholders who participated in the evaluation are listed in Appendix 2. The analysis drew on multiple sources of information and methods to answer each question. The evaluation team identified emerging themes from looking across the information sources, triangulating data to cross-verify findings, testing and validating emerging findings with other members of the evaluation team to make credible evaluative judgements.

1.6 Strengths and limitations

The main strengths of the evaluation approach and methodology are that it captures both specific findings relating to MFAT's investments in eye health and rich information on the wider context for the performance of these investments. The range of stakeholders who engaged in the evaluation provided multiple perspectives on eye health activities, including from front-line community health workers, specialists doctors and nurses, health service planning and management, research and from representatives of professional bodies. A large number of stakeholders were extremely knowledgeable about eye health activities in the Pacific which contributed to a strong evidence base.

The main limitations of the evaluation are:

- The findings suggest that the impact and sustainability of visual impairment activities are very context-dependent. This limits the ability to generalise the findings from one Pacific country to another.
- Data limitations on the eye disease burden in the Pacific limit the ability to determine the extent to which the health system response is addressing needs and the extent of the remaining need.

- The large number of health system responses to visual impairment in the Pacific and lack of nationally aggregated data in these responses, limits the ability to accurately determine the level of services being provided.
- It is difficult to isolate the difference that specific investments in visual impairment have made in the Pacific given the large number of health system responses and the varying degree to which different responses are integrated.
- Finally, the design of the evaluation meant that we did not speak to visual impairment service consumers.

1.7 Structure of this report

The remainder of this report is set out as follows:

- **Section 2.1** provides a contextual review and analysis of the visual impairment disease burden in the Pacific compared to the overall burden of disease.
- **Sections 2.2 to 2.7** set out the main evaluation findings, addressing the questions relating to relevance, impact and sustainability. The sections are structured around the main health system building blocks of:
    - Leadership and governance
    - Healthcare financing
    - Health workforce
    - Health information
    - Service delivery
    - Medical supplies and equipment.
- **Section 3** contains the main evaluative conclusions relating to relevance, impact and sustainability.
- **Section 4** identifies good practice and areas where it is important to learn from in any future support for visual impairment activities or other interventions.
- **Section 5** addresses the final evaluation question ('what should MFAT do?') and provides recommendations to inform future support for visual impairment activities.

2 Overarching Findings

This section sets out the strategic context for visual impairment activities in the Pacific, and provides the main evaluation findings on the relevance, impact and sustainability of visual impairment activities.

2.1 Context review

2.1.1 Visual impairment

The majority of cases of blindness are occurring in developing countries, and it is a condition that mainly impacts on older people. Globally, 285 million people are estimated to be visually impaired, 40 million of whom are clinically blind. Most of these people live in developing countries, and over 80% are aged 50 and above[7].

There are four levels of visual function, according to the International Classification of Diseases - 10 (Update and Revision 2006):

- normal vision
- moderate visual impairment
- severe visual impairment
- blindness.

Moderate visual impairment combined with severe visual impairment are grouped under the term 'low vision': low vision taken together with blindness represents all visual impairment. The different disease states giving rise to low vision are the key focus of prevention.

Eighty percent of all visual impairment can be prevented or cured[8]. 'Preventable' blindness can include primary prevention of the underlying conditions giving rise to blindness (such as preventing the development of diabetes through public health activities) through to clinical interventions such as the removal of cataracts[9], or the treatment of trachoma[10] or eye trauma care to prevent the progression of eye disease.

[7] http://www.who.int/mediacentre/factsheets/fs282/en/

[8] http://www.who.int/mediacentre/factsheets/fs282/en/

[9] Cataract is clouding of the lens of the eye which prevents clear vision. Although most cases of cataract are related to the ageing process, occasionally children can be born with the condition, or a cataract may develop after eye injuries, inflammation and other eye diseases.

[10] Trachoma is an infectious eye disease caused by the bacterium *Chlamydia trachomatis*, which spreads by contact with an infected person's hands and clothing.

Demographic changes are the biggest driver of increasing blindness. Globally, the number of persons aged 60 and above is expected to more than double by 2050 and more than triple by 2100, increasing from 901 million in 2015, to 2.1 billion in 2050 and 3.2 billion in 2100[11]. The median age, that is, the age that divides the population in two halves of equal size, is projected to increase from 30 to 36 years between 2015 and 2050, and to 42 years in 2100[9].

Two conditions, uncorrected refractive errors and cataracts, are responsible for the bulk of global visual impairment. Globally, uncorrected refractive errors are the main cause of moderate and severe visual impairment; cataracts remain the leading cause of blindness in middle- and low-income countries. The number of people visually impaired from infectious diseases has reduced in the last 20 years according to global estimates work[12].

As in other areas of health care, there is a shift in the disease burden from communicable to non-communicable diseases and this will also impact on the level of blindness in communities. Within NCDs, the rise in diabetes and its sequalae of diabetic retinopathy[13] will increase visual impairment, compounding the impacts of population ageing.

Currently, visual impairment is not a major contributor to the burden of disease globally. It is directly responsible for few deaths, and a small portion (6%) of the disease burden as expressed by DALYs (disability-adjusted life years) for low- and middle- income countries in the WHO Western Pacific region (which includes the Pacific, see Figure 1). The burden is strongly influenced by the underlying age distribution in the country. As the populations age, the burden of disease attributable to eye disease rises.

For the low- and middle- income countries in the Western Pacific[14], the pattern is similar to the rest of the world, with refractive errors being the main contributor to the disease burden followed by cataracts (Figure 1). However, the demographic changes seen in the rest of the world are slow to occur in the more populous Pacific Island states.

[11] United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP.241.

[12] http://www.who.int/mediacentre/factsheets/fs282/en/

[13] Diabetic retinopathy is composed of a characteristic group of lesions found in the retina of individuals having had diabetes mellitus for several years. Risk factors include duration of diabetes, level of glycaemia, presence of high blood pressure, dependence on insulin, pregnancy, levels of selected serum lipids and nutritional and genetic factors.

[14] http://www.who.int/entity/healthinfo/global_burden_disease/GBD_report_2004update_AnnexA.pdf?ua=

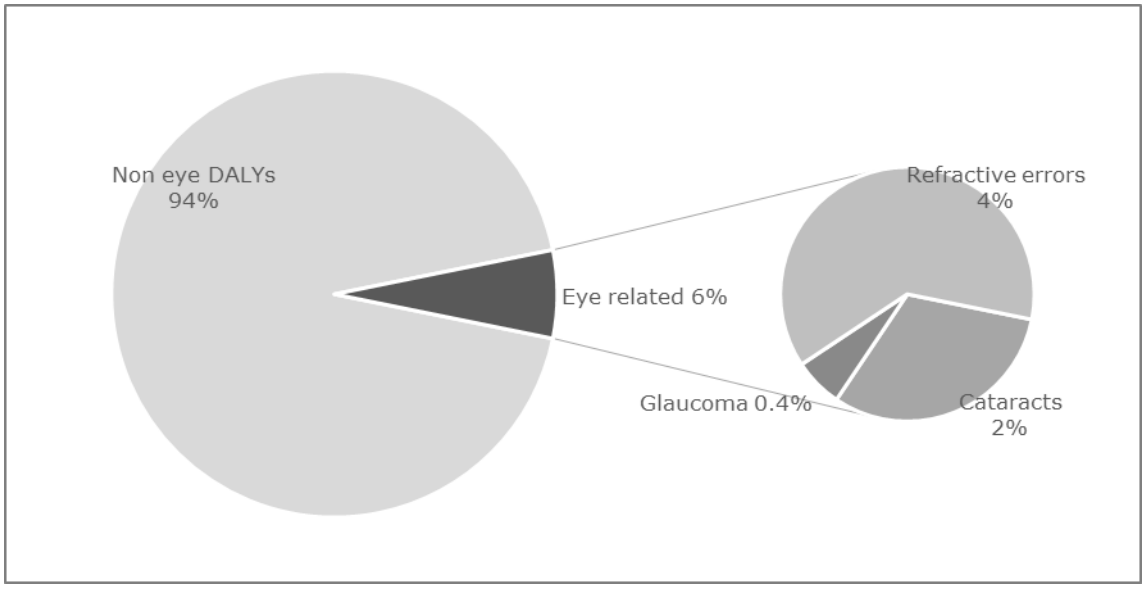

Figure 1: Disease burden in DALYs on low- and middle- income countries in the Western Pacific region.

Source: WHO WPRO

2.1.2 Pacific health context

Social, economic and environmental determinants

There are considerable differences in the wider social determinants of health in the seven countries that this evaluation focused on, as noted in Table 1 below, as well as marked differences between the seven countries and the rest of the world. One size does not fit all for the Pacific, and the Pacific is an outlier in many global trends and statistics.

In terms of Human Development, two countries are in the low HDI group (PNG and Solomon Islands), three are in the medium HDI group (Vanuatu, Samoa and Kiribati) and two are in the high HDI group (Fiji and Tonga). Of concern is the relative lack of progress in Human Development over the last decade – the rate of improvement in these seven countries is considerably less than the rate of improvement for other countries in their respective groups. The ranking for Vanuatu, Samoa and PNG dropped between 2013 and 2014, and remained unchanged for Fiji, Kiribati and the Solomon Islands. The HDI does not record the inequality adjusted HDI for these states, but other evidence suggests inequality is a major issue within these seven countries.

The populations and the growth rates also differ markedly. PNG with 7.6 million people represents 78.0% of the population of these seven countries, and is growing at 2.1%, or the equivalent of 160,000 people (almost the entire population of Samoa) a year. High growth rates are also seen in Kiribati, Solomon Islands and Vanuatu. At the other end of the spectrum, there is low growth in Fiji, Tonga and Samoa. For Samoa, this is not reflective of a low birth rate, but a high migration rate of young people. Considering the four high population growth countries together, their combined population is now 9.3 million, and will reach 12.1 million by 2030. Consideration of how the needs of an additional 2.7 million

people are going to be met is a core development challenge for the countries and their development partners.

Table 1: Human Development context for seven Pacific Island countries

	PNG	Fiji	Solomon Islands	Vanuatu	Samoa	Kiribati	Tonga
Human Development Index[15] rank	157	88	157	131	106	133	100
Population (2015 est.)[16]	7,619,000	892,000	584,000	265,000	193,000	112,000	106,000
Population density per km^2	16	46	20	22	65	137	160
Population growth rate[17] (2014)	2.1%	0.7%	2.0%	2.2%	0.8%	1.8%	0.4%
Economic growth rate (annual GDP growth, 2014)[18]	5.5% (2013)	3.8%	1.5%	2.0% (2013)	1.2%	3.0%	2.1%
World Risk Rank[19] (2014)	10	16	6	1		165	3
Population <5m above sea level	2%	11%	13%	11%	16%	99.8%	100%

[15] http://hdr.undp.org/en/content/human-development-report-2014.

[16] United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP.241.

[17] http://data.worldbank.org/indicator/SP.POP.GROW/countries/1W?display=default

[18] http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?display=default

[19] Risks of earthquakes, storms, floods, droughts, sea level rise. The risk of becoming a victim of a disaster because of an extreme event. http://i.unu.edu/media/ehs.unu.edu/news/4070/11895.pdf

The population in these Pacific countries is also ageing. The percentage of the population 60 years or over is expected to more than double in many countries by 2050 (Figure 2). This is the result of increasing life expectancy and decreasing fertility rates. Average life expectancy across these seven countries is expected to increase from 68.9 years over 2010–15 to 71.8 years over 2025–30. Average (across the seven countries) total fertility (average number of children per woman) is expected to drop from 3.7 to 3.1 over the same period[20].

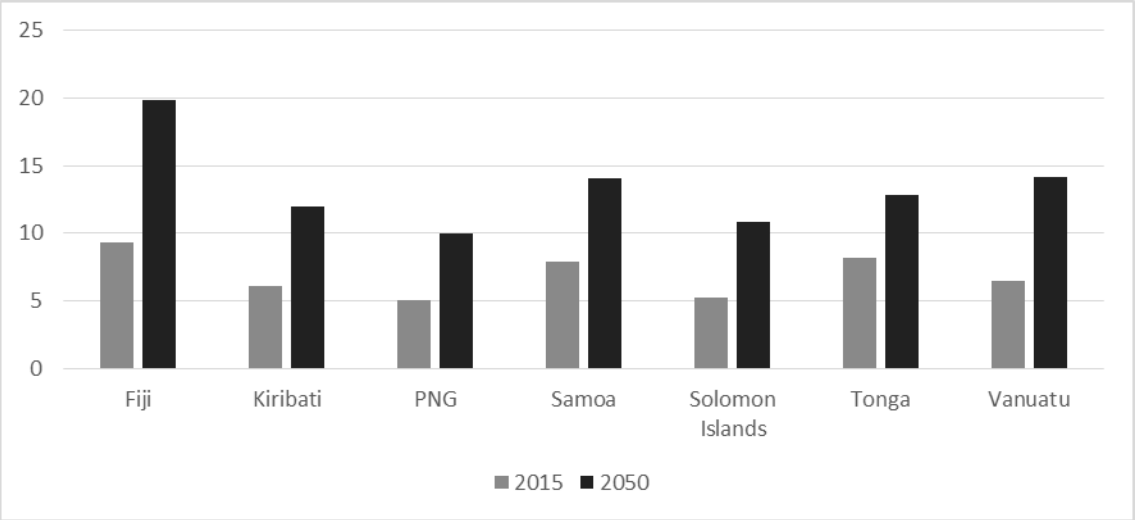

Figure 2: Estimate percentage of population 60 years and over, 2015 and 2050

Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP.241.

The implications for visual impairment of these wider determinants are considerable. Low economic growth limits the scope for countries to increase health expenditure. High growth rates mean the child populations dominate the demographic picture in those countries, and the issues of visual impairment as they relate to children need to be considered because of the sheer size of the child population, despite the fact that blindness in children is far less common than in the adult populations. Age is the single biggest determinant of eye health so an ageing population means there will be increasing demand for addressing refractive errors, cataracts and diabetic retinopathy.

The Pacific region is particularly susceptible to the impacts of climate change and disaster risk. Vulnerability to sea level rise and climate instability will herald profound changes for those vulnerable populations, with subsequent impacts on all services. High risk environments increase the difficulties of sustaining all services, both from the direct impact of the destruction of infrastructure and loss of life, and the indirect impact of reduced economic growth in the recovery phase, which takes years rather than months. The health impacts of climate change and disasters are extensive and include; the increased burden of

[20] United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP.241.

waterborne, foodborne and vector borne diseases, traumatic injuries and deaths from extreme weather events, increased burden of respiratory illnesses, increased mental health problems, compromised food security and heat related illnesses.

Population density and urbanisation differences have important implications for health service delivery and design, with efficiencies possible in heavily populated settings that are not feasible in sparsely populated islands and remote rural areas. Urbanisation has been slow to occur in the most populous states (PNG is 85% rural); however, several urban areas do have significant over-crowding (the population density in South Tarawa is 2,558 per square kilometre) which contributes to communicable diseases risk.

The Pacific is the most remote region in the world. This is a major barrier to growth in trade and services, and a significant driver of the cost of service provision including blindness services. It is estimated that a majority of Pacific Island countries are under the basic-needs poverty line. Food poverty (the inability to obtain healthy food) is an increasing concern in the Pacific and there is a growing reliance on imported food.

Gender inequality poses a significant barrier for long term development in the Pacific. Equality of school enrolments is improving; however, women are still underrepresented in political leadership and economic involvement. Domestic violence is also prevalent in the Pacific and eye trauma is a direct cause of blindness.

Health status

The diversity of the wider determinants and the points of difference from the rest of the world are also reflected in the health outcomes in the region.

Over the last 20 years under 5 mortality in the Pacific (the seven countries represent 87% of the region's people) has reduced, but the rate of reduction has been less than the rest of the world, with Pacific countries having lower under 5 mortality in world comparisons in 1995 and the situation is reversed in 2013 (Figure 3). Furthermore, the bulk of the Pacific populations will not achieve the MDG for reduction in child mortality, or the MDG for a reduction in maternal mortality.

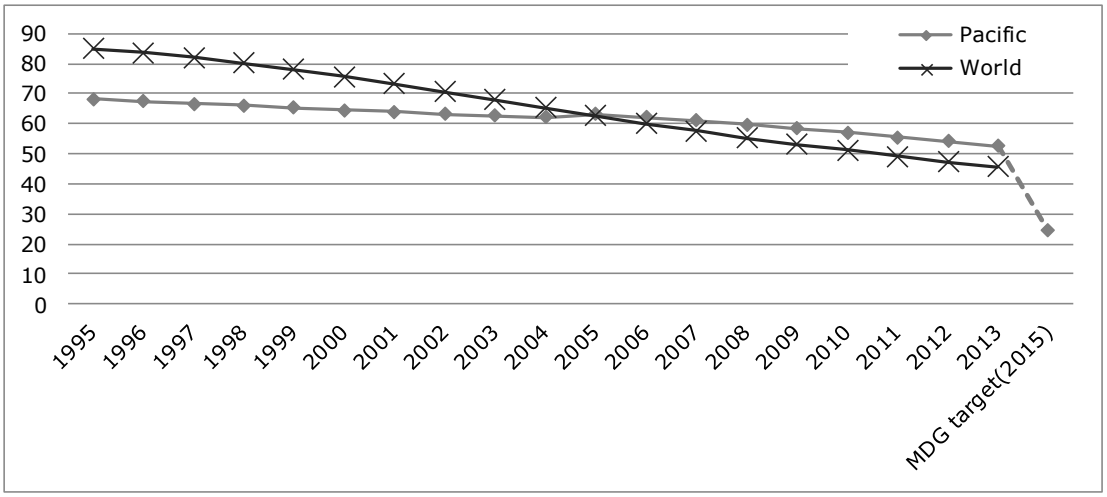

Figure 3: Children aged <5 years mortality (Deaths per 1,000 live births), 1995–2015

The overall picture for child mortality differs considerably between the seven countries (Figure 4). Fiji and Kiribati are showing the greatest rate of reduction, from the highest starting point. Solomon Islands, Tonga, Samoa and Vanuatu are showing modest reductions in mortality over time, whilst the Fiji rate reduction has stalled in recent years.

The significance of this is that communicable diseases, water and sanitation, and maternal and child health (MCH) will need to remain central to the health development agenda in the region for some time to come. It is clearly unfinished business for the bulk of the Pacific populations, and with the population growth described earlier the challenges in relation to communicable disease and MCH are likely to increase.

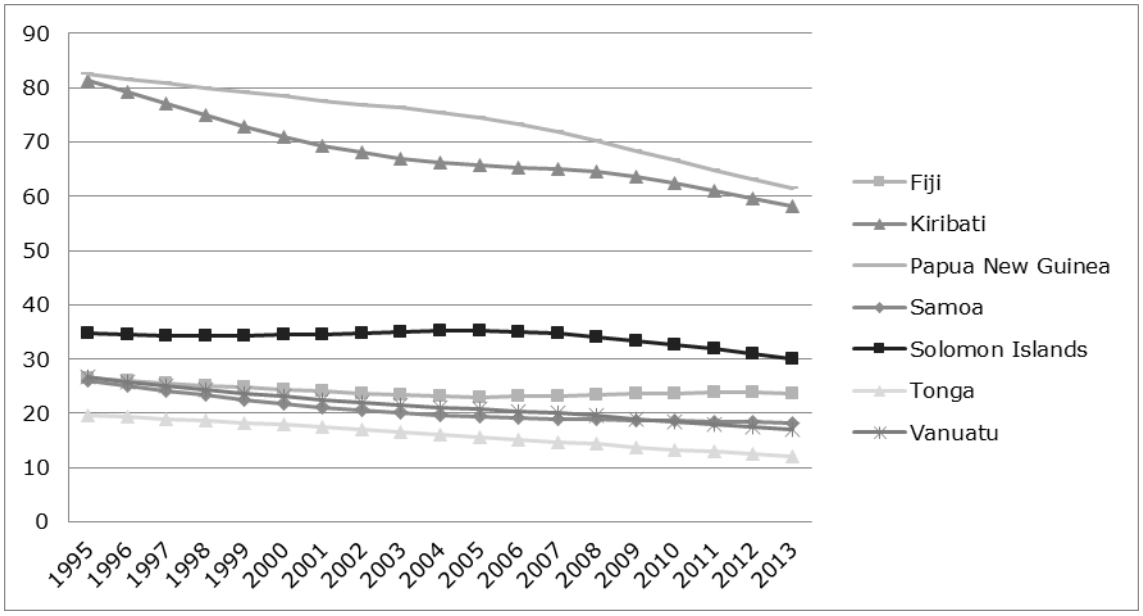

Figure 4: Children aged <5 years mortality (Deaths per 1,000 live births), 1995–2013

At the other end of the age spectrum, the rising impact of the NCD epidemic is taking its toll. Rates of premature death of adults in the region are higher for all seven countries in global comparisons and are likely to rise further (Figure 5). Of particular concern is the high rates seen in Kiribati and PNG, evidence of the extent that these populations are being challenged by the double burden of disease.

The Pacific has the highest rates of obesity in the world and the full impact of this on rates of diabetes, and eye sequalae from this condition, is still emerging.

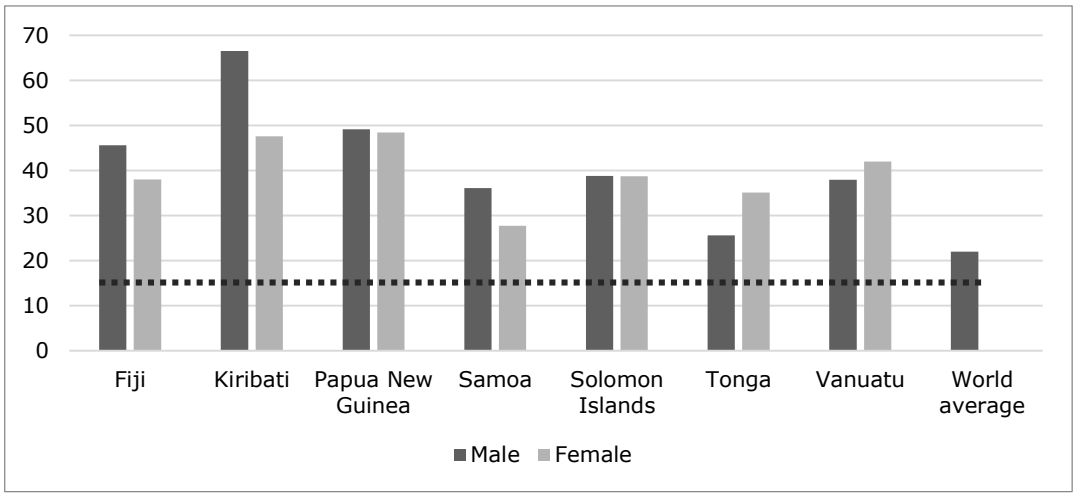

Figure 5: Rates of premature (under age 60) NCD-related deaths

In some countries the STEPS survey has now been completed twice, and the results are alarming. Fuelled by rising obesity, and increasing age of the populations, dramatic rises[21] in diabetes levels are being recorded (Figure 6), heralding that the full impact of the NCD crisis is still emerging, even for those countries that have been battling high rates for a number of years. Over the 10-year period rates rose from 20% to 30% for Fiji, from 16% to 34% in Tonga, and from 22% to 46% in Samoa. With diabetes effecting over one third of the adult population in some countries, its likely future impact on visual impairment will be considerable.

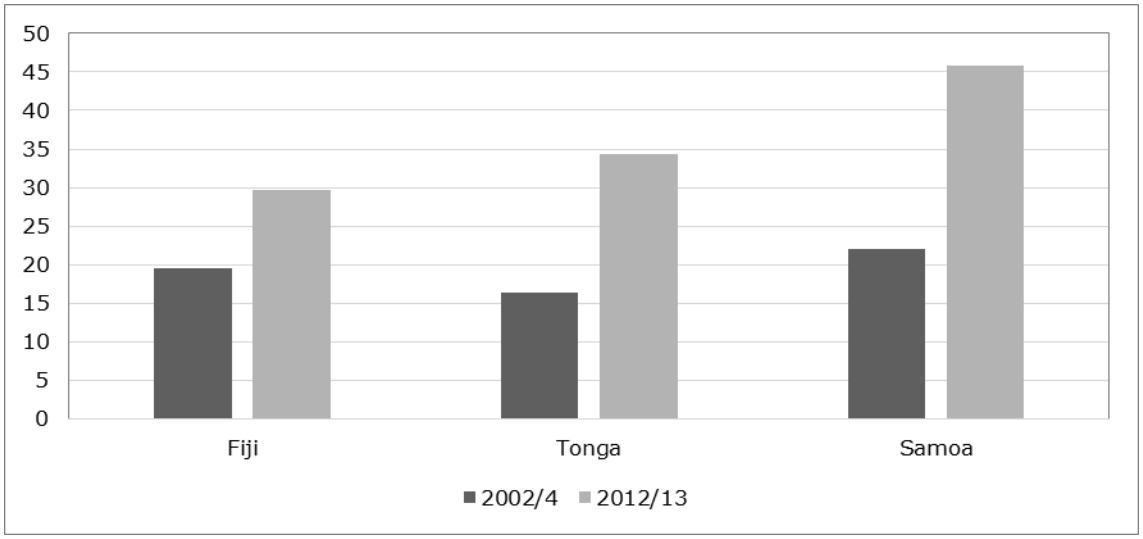

Figure 6: Percentage of adults with in raised fasting glucose/ on diabetes treatment, 2002–2013

[21] While the rise is significant, the way the STEPS methodology was implemented 10 years ago may have led to under-reporting. The actual results for 2012/13 are of more significance than the change over time.

Resources for health

Pacific Island countries lack adequate finances for health. Financial resources for health (Figure 7) differ across the seven countries, with the lowest levels found in PNG and the Solomon Islands. These levels are below the minimum required for any country to achieve the MDGs, and has been at this low level for the last 20 years, resulting in large deficits in infrastructure and training. Increased income from the minerals and energy extraction sector has provided additional government funding for the PNG health sector in recent years; however, volatile commodity returns are putting this level of spending at risk. Solomon Islands has had great investment in health in recent years, but also is carrying large deficits form a lack of investment in the past. To rehabilitate the Solomon Island health infrastructure is estimated to cost US$300m. At the other end of the scale is Samoa and Tonga, with expenditure of over US$200 per head. This is less than 10% of the per capita expenditure of surrounding countries such as New Caledonia, Australia and New Zealand.

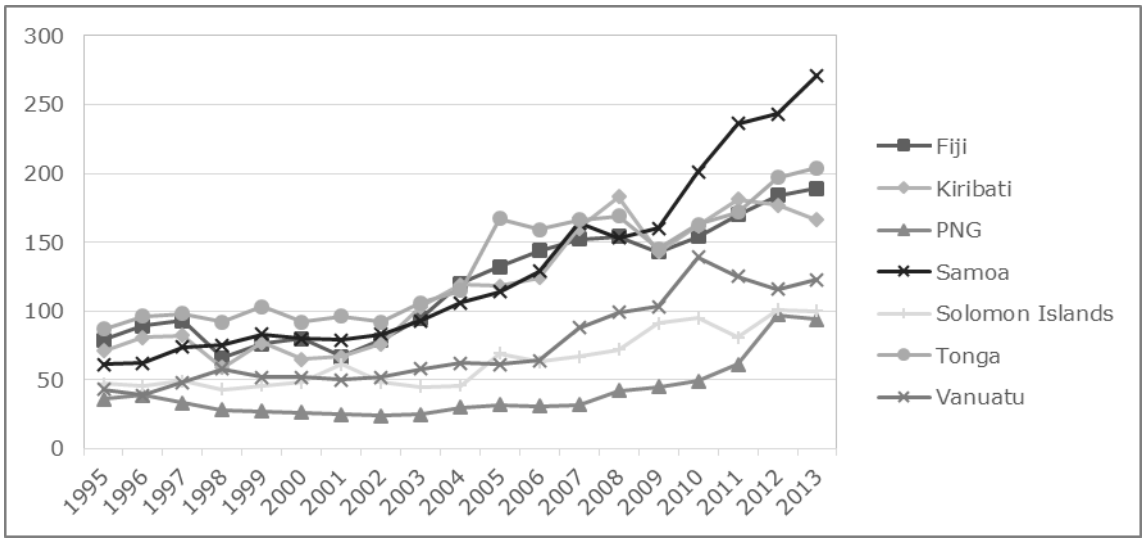

Figure 7: Total health expenditure per capita at average exchange rate (US$), 1995–2013

Overseas development assistance makes a significant contribution to the seven Pacific economies, especially in Solomon Islands and the smaller states (Figure 8). The region's major donor, the Australian Government, invested strongly in the health sector to 2014, but reduced funding by 10% in the Pacific for 2015-16. This will impact on the governments that are more donor dependent.

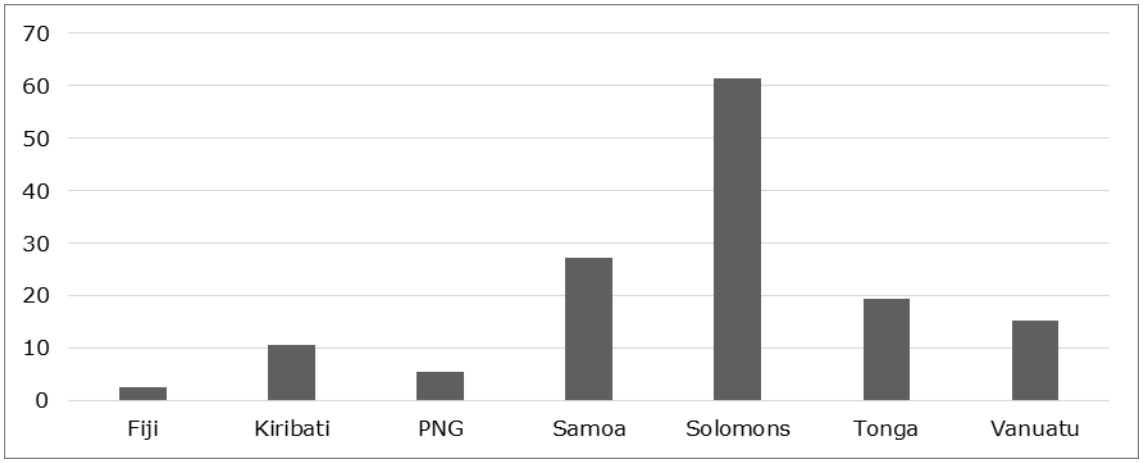

Figure 8: Net ODA (% GNI), 2014

Source: World Bank (http://data.worldbank.org/indicator/DT.ODA.ODAT.GN.ZS)

The health workforce for many Pacific countries is below the minimum the WHO estimates is required to deliver on the MDGs. PNG, Samoa, Vanuatu and the Solomon's are all below this minimal level (Figure 9). The actual health workforce required to effectively deal with the advancing NCD epidemic in the region has never been calculated, but it is assumed it is considerably more than that required to address the MDGs.

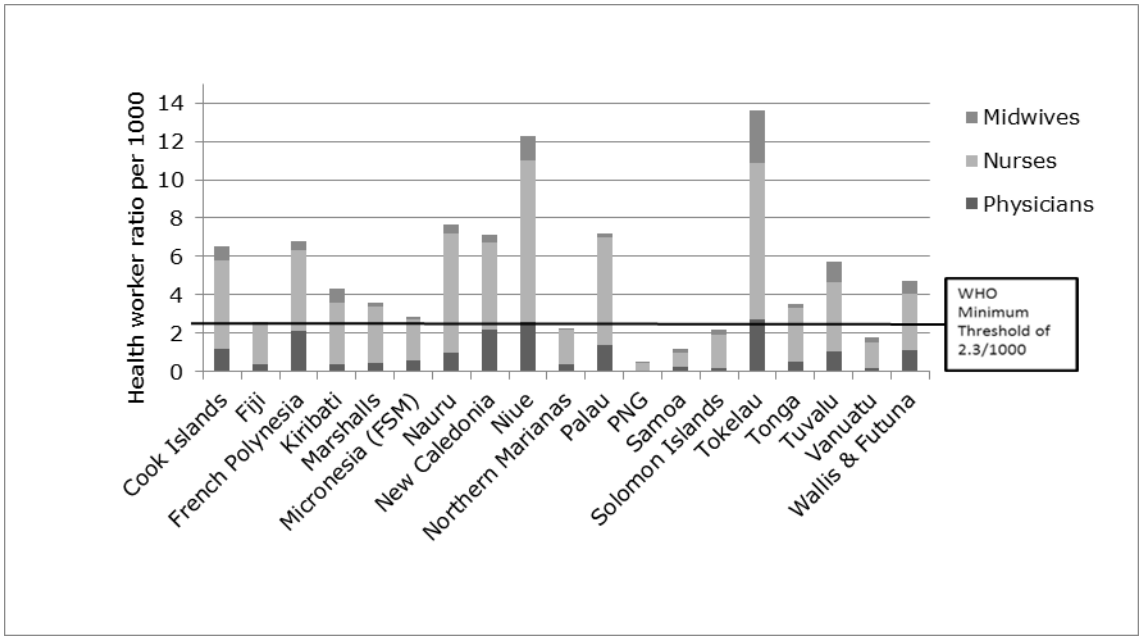

Figure 9: Pacific health workforce (doctors, nurses, midwives) density per 1,000 population

Sources: Updates from WHO Country Health Information Profiles (CHIPS), 2011, and WHO HRH

In summary, the seven Pacific Islands require a tailored approach to their health development. The countries with an advanced NCD epidemic need an approach focused on this, whilst the countries with rapid population growth also require a continued focus on MCH and communicable diseases, as well as developing appropriate NCD responses.

2.1.3 Visual impairment in the Pacific

There is limited population-based surveillance of eye health in Pacific countries. Data on eye health status and the burden of eye disease is largely limited to data collected through services/programmes and occasional research studies. The only recent national population-based survey on the prevalence, causes and impact of vision impairment and blindness was undertaken in 2009 in Fiji. It found that the prevalence of blindness in the population aged ≥40 was 2.6% while 7.2% had low vision[22]. The survey also revealed that cataract was the leading cause of blindness (accounting for 71.1%), and that uncorrected refractive error accounted for 63.3% of low vision while 25.0% was caused by cataract and 4.0% by diabetic retinopathy. Trauma also was a significant cause of blindness in Fiji.

In a population-based, cross-sectional study (Garap et al, 2006[23]) on almost 1,200 people over the age of 50 in PNG, it was found that 29.2% were visually impaired and 3.9% were blind (visual acuity of less than 3/60 in the better eye). The study showed refractive error (45.7%) and cataract (35.2%) were the most frequent causes of vision impairment in eyes examined. Applying these prevalence rates to the national population at the time, provides an indicative estimate of 146,000 people over 50 with visual impairment, of whom 20,000 were bilaterally blind. The situation is likely to have changed in the subsequent decade. Applying these figures to population estimates, it is possible to project the current and future disease burden in the older adult population (Table 2). This shows that in 2015 there are an estimated 224,700 people over the age of 50 with visual impairment, of whom 30,011 are bilaterally blind. This does not account for any changes in service delivery since the cross-sectional study in 2006. These calculations are indicative of the eye disease burden only, and are only provided in the absence of robust data.

[22] Ramke, J., Brian, G., Maher, L., Qalo Qoqonokana, M. and Szetu, J. (2012), Prevalence and causes of blindness and low vision among adults in Fiji. Clinical & Experimental Ophthalmology, 40: 490–496. doi: 10.1111/j.1442-9071.2011.02749.x

[23] Garap JN, Sheeladevi S, Shamanna BR, Nirmalan PK, Brian G, Williams C. Blindness and vision impairment in the elderly of Papua New Guinea. *Clin. Experiment. Ophthalmol.* 2006;34(4):335-341. doi:10.1111/j.1442-9071.2006.01219.x.

Table 2: Estimates of visual impairment burden in PNG, 2015 and 2030 (Indicative only)

Year	Population[24]	Population over 50[25]	Population over 50 with visual impairment	Population over 50 with blindness	Population over 50 with cataract
2015	7,619,000	769,519	224,700	30,011	270,871
2030	10,050,000	1,015,050	296,395	39,587	357,298

The incidence of new cases of cataract is unknown, although conventionally it has been stated as approximately 20% of prevalence. Ageing population will accelerate the incidence of cataract. In order to reduce the cataract backlog it is necessary to have a cataract surgical rate which is at least as great as the incidence of 'operable' (visual loss justifying surgery) cataract. For the indicative 2015 data for PNG above, assuming 80% of the cataract cases were operable, this means operating on at least 43,000 people (20% of (80% of 270,871)) annually, which is a cataract surgical rate (operations per million population per year) of over 5,500 (New Zealand has a cataract surgical rate of approximately 4,000).

The other consideration for the high growth countries of PNG, Solomon Islands, Vanuatu and Kiribati is the issue of blindness in children. The causes are different; corneal scarring (mainly from Vitamin A deficiency and measles), cataract, retinopathy of prematurity, refractive error (mostly myopia) and low vision. The rate of blindness is estimated to be 1.1 per 1,000[26]. To take the PNG example again, this would equate to around 190 children a year, 40% of which are considered preventable.

The situation in Pacific countries with high levels of diabetes requires special consideration. Firstly, it needs to be acknowledged, that this is new territory – never have human communities been exposed to this extraordinary level of type 2 diabetes at a young age. The diabetes will increase the prevalence of common eye disorders such as cataract and glaucoma[27], but will also put the person at risk of diabetic retinopathy. Diabetic retinopathy is detected in as much as 20% of type 2 diabetics, and is likely to progress to reduced vision and blindness. Its progression is a function of the length of time the person has had diabetes, their age, the quality of their hyperglycemic control, and other conditions such as control of hypertension and tobacco use. A study conducted in Vanuatu has even higher prevalence of both diabetic retinopathy and visual impairment in type 2 diabetics in that country. Diabetic retinopathy was present in 52.9% and sight-threatening retinopathy

[24] United Nations Department of Economic and Social Affairs/Population Division. World Population Prospects: The 2015 Revision, Key Findings and Advance Tables.

[25] Percentage based on 2011 Census (10.1%). Does not account for ageing population.

[26] Gilbert CE, Anderton L, Dandona L, Foster A. Prevalence of visual impairment in children: a review of available data. *Ophthalmic Epidemiol.* 1999;6(1):73-82.

[27] Glaucoma occurs when the optic nerve at the back of the eye is damaged, often in association with an increase in pressure inside the eye.

requiring urgent referral was present in 22.1% of patients[28]. A study in Fiji found the prevalence in diabetes among Fijians aged 40 and above was 41%, of whom only 36.6% had been diagnosed before the study. Of those with a previous diabetes diagnoses, diabetic retinopathy was present in at least one eye in 26.6% of the participants[29].

Trachoma has been identified as an issue in a number of Pacific countries; however, a number of stakeholders in the evaluation indicated that the data was inconsistent and contestable. Results from surveys conducted in 2012 indicate prevalence rates of potentially sight threatening trachoma (trachomatous trichiasis) of 7.4% in Fiji (higher than expected and subject to verification), 0.1% in the Solomon Islands, and 1.6% in Kiribati[30]. Rates of active trachoma reported in these countries[30] have subsequently been disputed following laboratory testing. In PNG, stakeholders reported only seeing a few cases of low grade trachoma and a trachoma mapping exercise is currently underway, targeting Central Province, Milne Bay, East New Britain and the Highlands Region.

The limited population level data on visual impairment does restrict the ability to develop effective population health interventions. FHFNZ has a schedule of proposed rapid assessment of avoidable blindness (RAAB) surveys over the next five years for countries with populations of 250,000+ (PNG, Fiji, Solomon Islands and Vanuatu) but the implementation of these is dependent on funding. In the absence of such surveys, a process of formally reviewing all the existing Pacific prevalence studies to get a more evidence based approach for calculating likely prevalence may be of value.

2.2 Leadership and governance

Strong leadership and governance—including the existence of effective strategic policy frameworks, effective oversight and stewardship, and strong institutional coalitions—is considered a key determinant of establishing sustainable visual impairment activities. This section examines the effectiveness of frameworks and processes for providing strategic oversight for the eye health system, the strength of administrative and clinical leadership, and activities designed to build leadership capacity. It considers regional and national leadership of eye health.

[28] Smith TST, Szetu J, Bourne RRA. The prevalence and severity of diabetic retinopathy, associated risk factors and vision loss in patients registered with type 2 diabetes in Luganville, Vanuatu. *Br. J. Ophthalmol.* 2007;91(4):415-419. doi:10.1136/bjo.2006.104174.

[29] Fischer-Harder K, Brian G, Sikivou B, Szetu J. Fiji Eye Health Survey 2009: Diabetes and diabetes retinopathy. 2010.

[30] http://iapbwesternpacific.org/download/common-eye-conditions-eye-health-information/trachoma/Final_IAPB_report_V2.pdf

Effective oversight and leadership for visual impairment activities is variable

The approach to leadership and governance varies across the Pacific and some countries have stronger governance and leadership structures than others. With eye health not featuring in countries' strategic health plans, there has been a focus on establishing national eye health plans/policies, and setting up national preventable blindness (PBL) committees to promote leadership and coordination. Table 3 shows a summary of the status of eye health plans and PBL committees, as well the status of dedicated eye health staff in health administration roles in the national departments/ministries of health.

Table 3: Status of national plans, eye departments and committees

Country	National eye health plan	National department/ ministry of health	National PBL committee
Fiji	Currently consulting on a draft of Fiji's third plan (last one ran to 2013).	Small team, mainly focused on public health. Budget is FJD 50,000 (inclusive of 2 salaries)	Have a government-led committee, NGOs involved but less frequently.
PNG	Operational, but has never been endorsed.	One position with a national role, focused on clinical work at PMGH.	Active committee, strong involvement of NGOs, lack of secretariat.
Solomon Islands	First plan runs to 2015; revised plan currently being drafted.	Three people in eye division and budget allocation of SID 150,000, plus similar amount from DFAT.	Have a committee that advises the MHMS.
Tonga	No.	No dedicated, non-clinical personnel.	No.
Vanuatu	Drafted but not yet approved.	Planning for a support coordinator but not in place yet.	No.
Samoa	Plan being drafted.	No dedicated, non-clinical personnel.	Have a committee; not sure how active.
Kiribati	Drafted and waiting to be approved.	No dedicated, non-clinical personnel.	Have a committee which doubles as a National Trachoma Taskforce.

The Solomon Islands has comparatively strong leadership and governance processes, characterised by:

- Successive four-year eye health plans.

- A three person Eye Division in the MHMS that is responsible for service coordination, reporting, training coordination and public health, and that manages a recurrent budget which is mainly allocated to outreach services.
- A Head Ophthalmologist and Lead Diabetic Retinopathy Ophthalmologist who provide clinical leadership.
- A local FHFNZ Programme Medical Director who provides leadership and clinical support and who was described as "the father of modern ophthalmology in the Pacific".

This leadership has built over a considerable amount of time, which appears to be a key reason for its strength. The current FHFNZ Programme Medical Director has been active in eye care in the Solomon Islands since the 1980s, and worked early on to establish an eye health programme with a budget line. The Head Ophthalmologist joined the eye department in 2006. Despite this longevity, stakeholders still believed the programme would be at risk if local leadership declined. Notably, the clinical specialists mentioned above act as advocates for strengthening eye health regionally and in other parts of the Pacific. The current leadership situation in the Solomon's does appear to be unique:

> *"It's [the Solomon's] a bit different, because of the foundation given by [name removed]. There is good leadership and an ongoing pipeline of senior, diehard fans of ophthalmologist to push. Local staff are more committed to ophthalmology than other countries."*

In contrast, national leadership and oversight for visual impairment in PNG is weak. The chief and the deputy chief ophthalmologists are employed by the NDOH but have no office in the department and work from Port Moresby General Hospital (PMGH), essentially functioning as clinical leaders. There is no recurrent budget for eye health or eye health policy personnel. The four-year national eye plan, which expires this year, was never endorsed by the NDOH, although it was operationalised. The current plan was prepared by the national PBL committee, and has not been integrated into the strategic planning process of NDOH. The committee has remained active in advocating for the plan's implementation; however, the plan did not appear to have a lot of visibility and work on developing a new plan has not begun. Reflecting the eye service delivery models in PNG, the PBL committee includes a large number of NGOs and provides a coordinating function. PNG Eye Care (a local NGO) did provide a secretariat function for the PBL committee at one point, but the NDOH has never provided funding for this purpose. It meets regularly and attendance is good, but the lack of a secretariat has meant that minutes of meetings are often not taken or distributed. Many NGOs report their activity to the PBL committee, but the committee itself does not produce an annual report collating this and there is poor compliance in provinces reporting to the NDOH.

National oversight of eye health services in Fiji is mixed. There is currently no national eye health plan, although one is currently being prepared by the MHMS and there were two previous plans. There is a small group of staff within the MHMS who are responsible for service coordination, running public health activities and managing the spectacle supply system. There is a national PBL committee, but it does not have a high level of visibility. The committee is chaired by a consultant ophthalmologist who is currently the Deputy Secretary

for Hospital Services in the MHMS. This appears to have increased the profile of eye health in the Ministry. As an institution, the PEI is a key player but its national function is focused on training and workforce support, which it does across the Pacific region. There are senior clinicians within the PEI who are strong advocates and clinical leaders for eye health care, including for diabetic eye care. Reasons cited for a deficit in leadership at a national level included:

- A lack of integration between PEI and government managed services. The evaluation heard divergent perspectives on this from multiple participants. Some participants considered the services to be well-integrated, with shared patient lists and mixed Colonial War Memorial (CWM) Hospital/PEI teams. However, other participants described the services as separate, with PEI leading surgical services and CWM Hospital staff focusing on refractive services.
- The continued use by both the PEI and government services of expatriate senior ophthalmologists who only stay in the country for comparatively short time periods.

The national frameworks for leadership and governance in Vanuatu, Kiribati, Tonga and Samoa are less mature. Regional organisations such as IAPB, PacEYES and the PEI regional outreach teams, play a key role in nurturing local leadership in these countries (see below).

Strong leadership does make a difference

Leadership and governance is critical to the success of eye health services across the Pacific. Several stakeholders made the link between the strong local leadership in the Solomon Islands and the government's support and recognition for eye health, including its support for the establishment of the REC. One stakeholder commented on the relative ease of creating new leaders when you have existing ones, noting the leadership succession approach occurring in the Solomon's.

Evidence that leadership makes a difference was more frequently drawn from examples of where services failed or struggled due to a lack of leadership. For example, poor leadership was cited as the reason the national eye care programme established by FHFNZ in Vanuatu struggled after it was transitioned to the Vanuatu Ministry of Health (MOH). The absence of national eye health plans that aligned activities with resources, including human resources, was seen as a barrier to human resources for health (HRH) planning and the creation of new posts within the health sector: "Currently the Minister is saying 'I need to see the plan' and they don't have one".

The benefits of strong leadership for eye health are widely recognised in the Pacific and, as clinical workforce training issues are being addressed, there does seem to be greater emphasis being put on developing leadership.

There are numerous regional organisations providing support for leadership

There is no shortage of development partner activity focused on supporting leadership and building leadership capacity in the Pacific. Table 4 shows the main partners and the nature of their activities targeting leadership.

Table 4: Activities that support leadership and build leadership capacity

Partner	Description	Main leadership activities
PacEYES	Professional membership organisations for eye nurses and ophthalmologists.	Host annual regional conference, co-organise Regional Leadership Development Programme, co-host a regional online clinical forum, facilitate overseas clinical attachments for training graduates, facilitate access to continuing professional development (CPD).
RANZCO	Medical college responsible for the training and professional development of ophthalmologists in Australia and New Zealand.	Co-organise and co-fund Regional Leadership Development Programme as part of its Annual Scientific Congress, co-host a regional online clinical forum, support PacEYES with CPD programme.
WHO WPRO	The WHO Regional Office for the Western Pacific responsible for advocating for action at all levels, from local to global, on health issues of public concern.	Provide technical advice to inform national eye health plans, programmes and workforce targets, define appropriate eye-care indicators and country specific targets, facilitate and support intercountry and regional collaboration.
IAPB	An alliance of NGOs, corporates and professional bodies promoting eye health through advocacy, knowledge and partnerships.	Through a co-chair for the Western Pacific region, advocate for and provide hands-on support in the development and implementation of national eye health plans aligned to the WHO global and regional action plans. Also support research to inform policy and planning, promote data collection and effective programme monitoring.
Vision 2020 Australia	Peak body for the eye care sector in Australia.	Advocate to the Australian Government and to DFAT representatives in country, promote collaboration and partnership working across its members.
FHFNZ	Provides eye care services and training for eye health workers.	Fund a number of the activities of other partners, including the major funder of the PacEYES regional conference and co-funding the Regional Leadership Development Programme (previously funded by DFAT). Provide leadership and advocacy support to graduates of its training programmes and has trained 12 senior nurses to provide workforce support and leadership to junior nurses.
SSCSiP	Supports countries to plan for, access, host and evaluate specialised clinical services, and to strengthen health worker skills, capacity and capability to meet clinical service needs.	Support PacEYES in the development of policies, regional guidelines and CPD, and provide funding to support 10–12 PacEYES members attend the annual conference.

The leadership support provided by the above organisations appears to be reasonably well coordinated and responsive to changing funding priorities. This degree of collaborative working is commendable. Given the range of partners, ongoing collaboration and alignment is critical.

The Regional Leadership Development Programme runs alongside RANZCO's Annual Scientific Congress, held in Australia and New Zealand. The programme, held over two weeks, involves a one day visit to a hospital, two days intensive management/leadership training, presentations, attendance at the four day congress, and development of a return to work programme tailored to each participant's situation. The programme targets a select number of PacEYES members who are identified as future leaders in eye health. The programme initially targeted ophthalmologists; however, because of the limited number of ophthalmologists in the Pacific, and the difficulty in getting released from clinics, the programme has been opened to include nurses. The 2015 programme in Wellington had four nurses and one doctor in attendance. Funding used to provide scholarships to attend the congress, but is now invested in the leadership programme.

As the only local (Pacific) organisation in Table 4, the evaluation found PacEYES was well regarded and is viewed as one of the better organised medical speciality organisations in the Pacific. In a collaborative partnership with RANZCO, PacEYES is taking an ever increasing role in providing advocacy for national governance and organisational structures, and strengthening its programme of CPD. With the support of FHFNZ, PacEYES is identifying training graduates who have the potential to go on and take up leadership positions as lecturers, managers and directors, including within the PEI. While PacEYES has members from PNG and PNG members do attend the annual regional conference, one participant in the evaluation felt that PacEYES had neglected PNG and that there was an opportunity to either extend its focus to PNG, or support the establishment of a similar/sister organisation there.

Building leadership capacity is dependent on external funding

A majority of the current approaches to building leadership and governance capacity are reliant on development partner contributions, and the continuation of these is not assured. The evaluation team heard that DFAT support to the IAPB, through the ABI, is likely to come to an end in 2016. The Solomon Islands is likely to be at a stage where it does not require support to establish and maintain governance frameworks such as an eye health plan and PBL committee, and individuals can continue to access CPD in leadership through PacEYES and RANZCO. However, the majority of Pacific Island countries have limited capacity to undertake strategic development and need ongoing support in advocating for governance structures and building their leadership capacity, particularly PNG where national level oversight is especially weak.

While PacEYES is still dependent on external funding and support (e.g. from RANZCO, MFAT/FHFNZ and DFAT/SSCSiP), it is focused on building local capacity to provide leadership and governance support over the longer term. The sustainability of PacEYES would appear to be integral to building long-lasting leadership for eye health in the Pacific. As PacEYES works to increase its membership base, Pacific governments have a role in supporting clinicians' involvement in PacEYES, including potentially supporting the costs of membership and releasing staff to attend events.

Pacific governments need to do the leading and have greater oversight

The eye health sector in each of the Pacific countries is largely led by NGO activities, with the exception of the Solomon Islands where the government is leading in collaboration with FHFNZ. This needs to change. Governments need to be far more in the driving seat, in terms of setting policies and plans, and leading coordination and reporting.

Despite significant support for the development of national eye plans, only the Solomon Islands had an endorsed, active plan at the time of this evaluation. This suggests a lack of ownership of the plans (many are in draft form or have lapsed) and a lack of leadership for the implementation of plans. Again, it was found that only government in the Solomon Islands was leading the coordination and reporting of eye health services at a national level.

Small eye health units within health departments/ministries, but under the control of the head/chief ophthalmologist, should be playing a critical role in:

- Supporting the development of eye health plans, ensuring that they are linked with national health strategic planning processes, including health financing mechanisms and workforce planning.
- Supporting the functioning of national PBL committees as advisory groups.
- Integrating eye service policy into other health service policies, particularly in relation to NCDs.
- Supporting eye health activities in provinces/districts, including through funding outreach services.
- Coordinating all service activities, including from government and NGOs.
- Collecting data on all activities and reporting into the government's health information system (HIS).

Positioning governments in this type of leadership role will take further targeted support from development partners. FHFNZ signalled a desire to funnel future support further 'upstream' to policy and planning initiatives, and is proposing to separate its Fiji programme out from the PEI's regional programme to boost the national focus and engagement with the Fiji Government. This would appear to be a valuable initiative, and is consistent with the recommendations from 2011 PRBPP evaluation. It is important that these initiatives focus on strengthening the eye health system (and not only the PRBPP) and do not compromise government control and leadership.

2.3 Health financing

This section considers the amount of money spent on visual impairment activities, the source and allocation of this funding, and the extent to which funding arrangements are integrated.

It is difficult to determine the total level of financial resources allocated to eye health

The amount of finance invested in visual impairment activities in the Pacific is hard to estimate. Pacific Island governments contribute significantly through staff establishment

budgets, including the salaries of the approximately 190 graduates of the PEI and training programmes in PNG, including while staff are attending training. Governments are also, to varying degrees, meeting many of the costs of running eye care facilities (utilities and maintenance), the costs of supplies and consumables, travel and other associated costs of local outreach services, and public health activities. Many of these costs are shared with development partners. Costs associated with facilities and supplies are generally met through specific budgets for these functions within the total health budget. Where they exists, dedicated budgets for eye care activities are small; for example, the MHMS in Fiji has a budget of around $35,000 for service coordination, eye health promotion and glasses distribution, including the costs of personnel; the MHMS in the Solomon's has a budget of around $55,000 (50% funded by DFAT) which is mainly used to support outreach services.

Development partners, including MFAT and FHFNZ, continue to be the main source of finance for non-salary expenses. This includes meeting the costs of new or refurbished infrastructure (including initial maintenance of new clinics), training costs, funding visiting specialists, purchasing specialist equipment, purchasing supplies and consumables (where government has not), delivering outreach services, and providing workforce support and supervision. The salaries of a number of non-visiting eye health professionals are also funded by development partners.

Out-of-pocket expenses for consumers are minimal, and are often waived for those who cannot afford them. Some governments (national and provincial) meet transport costs for consumers to attend clinics but elsewhere this costs is met by the consumer. Outside of private optometry provision, spectacle supply generally operates on a cost-recovery basis, costing the consumer anywhere from around $5 to $25.

In Fiji the PEI are currently pushing for a review of fees and charges under the Public Hospital Act. It is hoping to be able to charge a higher fee for non-Fijian residents who access its services, as well as residents who can afford it, as a way of generating more revenue and making the service more self-sustaining. It is also hoping to be able to retain a higher proportion of the fee for non-Fijian residents, which currently goes to the MHMS.

Within this system, MFAT, DFAT and FHFNZ[31], have been key sources of finance. MFAT ($13.7 million) and DFAT ($14.2 million) have contributed $27.9 million to the PRBPP since 2003, along with MFAT's investment of $3.8 million in the REC. Through its Avoidable Blindness Initiative (ABI) and SSCSiP programme, DFAT has also invested in the construction of eye clinics in the Solomon Islands, supported the costs of outreach services (as mentioned above), supported PacEYES and the regional co-chair positions within the IAPB. Other sources of finance include (this list is not exhaustive):

- FHFNZ, through a range of New Zealand donors, has invested $0.75 million in a mobile eye clinic for Fiji.

[31] FHFNZ estimates that around half of its work in the Pacific is funded through private donations, including public fundraising.

- The World Diabetes Foundation (WDF) has invested around $0.6 million in the establishment of a diabetes eye clinic at the PEI and the upgrading of an existing clinic in Lautoka; and around NZ$0.33 million in equipment at the REC.
- The Queen Elizabeth Diamond Jubilee Trust has provided funding to scale up diabetic retinopathy interventions in the Pacific, a significant portion of which was used to purchase equipment for the REC.

While it is difficult to work out the total costs of providing the current level of eye care services, several stakeholders suggested that it would be helpful if development partners communicated the cost of their contributions to governments. This would help governments evaluate whether and which parts of eye care services they would be prepared to fund.

An increasing share of funding for eye health services is coming from government sources, but the transition is slow and piecemeal

There is some evidence that governments are beginning to pick up a greater share of the costs for eye health services in the Pacific, the most convincing of which is the salary costs associated with the increasing number of specialist nurse positions. These positions are generally within the existing public service establishment, and remuneration is not generally adjusted as a result of the post-graduate training; nevertheless, they are specific eye health positions. It also includes nursing staff at the Madang and PEI eye clinics progressively transferring from the FHFNZ to the Modilon General Hospital (MGH) and CWM Hospital payrolls respectively. Further evidence that governments are picking up costs include:

- In 2015, for first time, two students at DWU in PNG had their tuition fees sponsored by their employers to do the post-graduate diploma in eye care.
- In 2014 the Kiribati MHMS contributed to the tuition costs of a trainee ophthalmologist at PEI.
- The Provincial Health Authority in Madang recently approved PGK 40,000 (around $20,000) for 60 CHWs to attend a four day eye health training course.

In PNG, DWU and FHFNZ share the costs of tutor salaries (one tutor each). DWU is largely privately/donor funded and has not explored the possibility of government funding the training; not even the PGK 4,000 (around $2,000) per student government subsidy. Stakeholders felt that it would be difficult to get access to government funding, but they also expressed a desire to stay outside of the government system and feared losing autonomy if they became dependent on government funding. The evaluation team believes that MFAT and FHFNZ need to push DWU on this; at the very least there is a need to engage with government on the PGK 4,000 subsidy.

FHFNZ has MOUs with the Solomon Islands and Fiji governments concerning the ongoing maintenance and operation of the REC and PEI. These agreements are, broadly, based on a transition of responsibility from the FHFNZ to government and, in the case of the PEI agreement, include provision for the FHFNZ to release four nurses per year to be absorbed in to the MHMS from January 2016 (until a total of eight nurses have been released). These agreements are a strong signal of intentions; however, several stakeholders in the evaluation were concerned that limited buy in from government and scarce resources would affect these agreements. There were concerns that the transition was too slow and that, in

the cases of the nurses at PEI, there was a risk that these positions would be lost from the eye department once transitioned to the MHMS.

There is not a great history of eye programmes being continued when responsibilities have transitioned to government. For example, FHFNZ had helped to establish a national eye care programme in Vanuatu over 5 years before transitioning it to the Vanuatu Ministry of Health (MOH). According to one stakeholder, the MOH failed to prioritise the programme and did not adequately resource consumables. Vanuatu continues to require 1–2 outreaches per year from the PEI. The situation with the eye clinic in Kimbe, PNG has been more successful since its management transitioned from FHFNZ to the Kimbe General Hospital in 2014 following 4 years of support through the PRBPP. The clinic continues to provide basic eye care services through five eye care nurses; however, it no longer has a resident eye doctor.

There is a need for greater alignment between government and development partner financial systems

The international aid effectiveness agenda includes principles relating to harmonisation and alignment of donor practices, and the use of local systems. The International Health Partnership notes that country financial management systems are too infrequently utilised and that harmonisation and alignment is critical to ensure that scare resources are used efficiently.

Ideally, development partners involved in visual impairment activities would be channelling their finances through partner government financial systems, and providing any support needed to strengthen those local systems. Development partners have their own back stories, however, with their own sets of financial accountabilities and accountability to Ministers and private donors. In this evaluation, there is evidence of MFAT and FHFNZ having to make a trade-off between the achievement of results and efficiency over the short term, and strengthening local systems over the longer term. This has resulted in parallel financial systems, as is the case with a spectacle supply system in the Solomon's. The system was set up and managed by the Brien Holden Vision Institute (BHVI) where revenue from the sale and for the purchase of glasses was managed by the Institute in a separate bank account, bypassing the MHMS. When the system was transitioned to the MHMS to manage, and following the consolidation of Ministry accounts following a fraud case, the revenue went through a consolidated account. Revenue from the sales of spectacles was no longer ring-fenced for the purchase of new glasses and, at the time of the evaluation fieldwork, all ordering had stopped and stock was running low. In response, FHFNZ had recently set up a separate system involving a new supply chain and a separate FHFNZ managed bank account. At the time of the visit, the staff at the optical workshop were having to operate two bank accounts, one for the government system (as it ran down) and one for the new FHFNZ system.

The issue of multiple financial systems was also raised by stakeholders in relation to the REC in the Solomon's. DFAT expressed concern that the budget for the REC was coming through the FHFNZ into a separate bank account at the MHMS. DFAT's strong preference was for there to be one bank account, with appropriate controls around it, and all development partners committed to using it. As well as the risks associated with multiple bank accounts, DFAT were concerned at the added transaction costs to government and its development partners. Clearly there were considerable efforts by all parties to get agreement on the use

of financial systems for the REC, and the issue is not specific to the REC. MFAT acknowledged that it would have been preferable to use existing Solomon Islands Government' systems, noting that establishing separate systems undermined what donors were trying to achieve under development effectiveness principles. MFAT also expressed concern that the process risked harming its relationships with other donors. FHFNZ reported that it followed the MHMS Eye Division's lead, which was preference for a separate REC account.

The existence of multiple financial systems operating in parallel is not ideal, and the evaluation team accepts that tensions between donors, development partners and recipients are common and that there is not an easy solution. It may not always be possible to channel funding through a single government account; but similarly the solution is not always to do what the recipient government prefers. Setting up separate systems is what many actors would prefer; but it does not follow agreed aid effectiveness practice. MFAT, FHFNZ and recipient governments need to further explore ways to use existing fiduciary systems that provide for mutual accountability, before setting up separate systems.

The level of health financing is perhaps not the greatest barrier to sustaining eye health activities

Clearly the provision of comprehensive, accessible and good-quality eye health services in the Pacific is still dependent on donor support. Including the current funding from development partners, the overall level of resourcing is probably not the greatest barriers to sustaining services, with the possible exception of PNG. Several stakeholders felt that 'lack of funding was not the main problem' and that, particularly as workforce needs were progressively met through the training provided by PEI and in PNG, sustaining eye health activities would become more efficient and less dependent on donor support. PNG is the possible exception due to the more acute workforce shortages and the lack of funding for adequate outreach services across all provinces.

2.4 Health workforce

Training eye care professionals and providing workforce support to graduates who have returned to their country is one of the foundations of the PRBPP. FHFNZ remains the dominant development partner in this area. This section begins with some context covering workforce utilisation, capacity and planning, before assessing achievements in training and support.

2.4.1 Human resource utilisation and planning

The growth in the number of trained eye health professionals is impressive

Data on training graduates combined with local knowledge provides a reasonable indication of the total eye health workforce in the Pacific (Table 5). The significance of the training provided under the PRBPP is very apparent, particularly at the nursing level. The majority of the ophthalmologists have been trained either in PNG or outside of the region, or are visiting doctors (e.g. two of the ophthalmologists interviewed were Nepalese).

Table 5: Current (September 2015) clinical workforce engaged in eye health services

Country	Number of active ophthalmologists	Number of active eye care nurses / ophthalmic nurses	Number of eye care technicians[32]	Number of optometrists[32]
PNG	10	57[33]	9	5
Fiji	8	31[34]	2	5
Solomon Islands	4[35]	27		
Vanuatu	1[36]	7		
Samoa	0[37]	9		1
Kiribati	1	4	5	
Tonga	0[38]	4		
Total	**24[39]**	**139**	**16**	**11**

Source: Key informant interviews (unless stated otherwise)

[32] Data supplied by FHFNZ

[33] This figure is based on the number of DWU graduates who are currently actively engaged in the eye health workforce.

[34] This figure is based on the number of active PEI graduates from 2006–2014, and the expected 2015 graduates.

[35] One at post-graduate diploma level. Plans to start MMed in 2017.

[36] At post-graduate diploma level. Plans to start MMed level in 2016.

[37] One doctor in training until end of 2016. Another doctor left the service in July 2015 and recruitment is in progress for a replacement.

[38] One doctor in training until end of 2018.

[39] Five of these are graduates of the PEI.

It is important to recognise that not all these eye care professionals work full time in either public services or eye care services. A number of ophthalmologists, at least in PNG, also work part-time in private practice. Many eye nurses do not work full time in an eye clinic, frequently working outside of their specialty. For example, two of the nurses the evaluation team interviewed work part time on TB elimination programmes, with one only spending an average of one day a week on eye care. Specialist nurses also get re-deployed to other priorities as required, as was the case with eye nurses who helped with diarrhoea and measles outbreaks following flooding in the Solomon Islands in 2014. Finally, as discussed in section 2.7 of this report, a lack of adequate equipment and supplies also affects the ability of staff to function at full capacity.

Encouragingly, attrition does not appear to be a significant issue. A small number of staff are lost to administrative roles or other services (e.g. there are three trained ophthalmologists in PNG in administrative roles), and to poor health. Retirement looms as a bigger issue with the retirement age in most countries 55 years.

Current capacity falls short of WHO guidelines

The number of eye care professionals required for comprehensive provision of eye care services is one ophthalmologist per 100,000 people and one mid-level eye care professional per 50,000 people. In the smaller Pacific countries (i.e. excluding PNG), FHFNZ is aiming for one mid-level eye care professional per 25,000 people. Using these targets, and the data in Table 5 on current professionals, Table 6 shows that while some countries are well on the way to achieving WHO guidelines and FHFNZ targets (Fiji, Solomon Islands and Kiribati), overall the region is sitting at around 25% of the required number of ophthalmologists and 58% of the required number of mid-level eye care professionals. This is mainly due to the large shortages in PNG. This shortfall needs to be seen within the context of huge gaps in HRH across the sector. FHFNZ reports that the Pacific Islands are on track to be fully self-sufficient in eye care training and provision by 2021[40]. For example, as noted in Table 5, Samoa is expected to have one of its target of two ophthalmologists trained by the end of 2016 (the other is currently being recruited), while Tonga is expected to achieve its target of one ophthalmologist by the end of 2018.

The shortfall of ophthalmologists in PNG is someway off being addressed. There are currently only five ophthalmologists in training (two at MMed level). Realistically, there is a need to be have three or four doctors in training per year to seriously address the shortfall. The number of ophthalmic nurses is growing; at 57 this is up from 23 at the end of 2010, and there are currently 8 to 10 training at DWU each year. The WHO has recommended that the number of mid-level personnel required could be halved if there were an equivalent number of primary eye care workers trained in basic eye care. Mid-level training in eye care for community health workers (CHWs) has been discontinued. As discussed in section 2.3, a four day basic eye care training course for CHWs, designed to improve referrals, has recently commenced in Madang.

[40] PRBPP Phase 3, Annual Activity Progress Report, 1 January to 31 December 2014.

Table 6: Progress in meeting workforce requirements

Country	Population (2015)	Required ophthalmologists	Required mid-level eye care professionals	Current ophthalmologists	Current mid-level eye care professionals	Percent of target achieved (ophthalmologists)	Percent of target achieved (mid-level professionals)
PNG	7,619,000	76	152	10	57	13%	37%
Fiji	892,000	9	36	8	31	90%	87%
Solomon Islands	584,000	6	23	4	27	67%	117%
Vanuatu	265,000	3	11	1	7	33%	64%
Samoa	193,000	2	8	0	9	-	113%
Kiribati	112,000	1	4	1	4	100%	100%
Tonga	106,000	1	4	0	4	-	100%
Total	**9,771,000**	**98**	**238**	**24**	**139**	**25%**	**58%**

Government engagement in workforce planning is weak

Analysis of human resources for eye health is led by FHFNZ. Some governments have replicated this forecasting in national eye health plans. However, many national eye health plans are silent on workforce and training needs, reflecting the disregard given for HRH planning in many national health strategies in the Pacific. As a result, workforce planning for eye health is currently not integrated into wider health workforce planning, and government ownership of such planning is weak.

In Madang, the evaluation team witnessed how FHFNZ considers workforce needs in different provinces in targeting new trainees and in assessing training applications. This includes consideration of the availability of supervision and support from an ophthalmologist once the trainee graduates and is re-deployed to their health service. We did not see evidence of even this relatively simple, yet effective, level of analysis happening within government health service planning. In the absence of FHFNZ influencing where trainees are recruited from and how they are accommodated back in their service following training, the impact of the training in eye health would be considerably weaker.

Government needs to take more responsibility for workforce planning, particularly so that it can:

- Consider workforce training needs alongside other health sector training needs.
- Better influence the training that institutions provide to ensure it meets national needs (e.g. training for different professionals, including CHWs and Medical

Assistants / Health Extension Officers, who may provide an effective alternative to meeting the demand for services).

- Be aware of the costs of workforce training, and can consider efficiencies.
- Better align workforce deployment with wider plans for the health service nationally, and with planning for infrastructure and equipment.
- Ensure a pipeline of future trainees as part of succession planning (e.g. to replace retirees).
- Better consider the needs of an integrated health workforce required to manage chronic diseases such as diabetes.

2.4.2 Workforce training

Within the Pacific there are three main providers of eye specialist training

The main providers of specialist eye care training in the Pacific are the PEI/FNU, DWU and UPNG. A summary of these training opportunities is shown in Table 7.

FHFNZ plays a significant role in training at two of these institutions, providing the majority of teaching staff and is the major funder of tuition fees. RANZCO is an active partner of the PEI, having helped revise the curriculum for the two ophthalmology programmes and through the provision of 7–8 visiting fellows per annum who undertake one week of sub-speciality teaching. RANZCO's support has previously been funded by DFAT and through its own foundation. FHFNZ is currently supporting RANZCO's costs through its own core funding.

Table 7: Specialist eye care training programmes in the Pacific

Provider	Status	Main partners in eye health	Programmes offered	Student roll
PEI/FNU Based in Suva, Fiji	Public university	FHFNZ, RANZCO	• Post-Graduate Certificate in Eye Care • Post-Graduate Certificate in Diabetes Eye Care • Post-Graduate Diploma in Eye Care • Master of Community Eye Care • Post-Graduate Diploma in Ophthalmology • Post-Graduate Diploma in Vireo-Retinal and Diabetes Eye Care • Master of Medicine in Ophthalmology	In 2014, 39 across all programmes, 9 of whom were in the MMed Student roll from across the Pacific region, including 7 from PNG (6 in the extra-mural MCEC)

Provider	Status	Main partners in eye health	Programmes offered	Student roll
DWU Based in Madang, PNG	Privately governed university that receives some government support but is largely privately funded	FHFNZ	• Advanced Diploma in Eye Care	8–10 per annum, from PNG
UPNG Based in Port Moresby, PNG	Public university DFAT funding is critical for operation of School of Medicine and Health Sciences	CBM, Lions Foundation, PMGH	• Post-Graduate Diploma in Ophthalmology • Master of Medicine in Ophthalmology	Currently 5 trainees total in both programmes, from PNG

PMGH ophthalmologists provide the majority of tutorage on the programmes at UPNG. The Lions Club International Foundation and CBM are currently supporting UPNG to establish a National Resource Centre for Eye Health. The Lions Foundation has provided funding to refurbish a building to house the centre while CBM is funding a position for an ophthalmology lecturer, whose clinical base will be in Goroka. At the time of the evaluation field visit, the refurbishment was almost complete and CBM were in the final stages of appointing an ophthalmologist. The resource centre is expected to coordinate:

- Training of ophthalmologists.
- Hosting education and professional development for local eye care personnel including nurses and spectacle technicians.
- Training of eye care personnel in dispensing and supply of low cost spectacles.
- Training of all medical students in eye care and eye health awareness.
- Health promotion activities to increase awareness of eye health in PNG.
- Capacity development of the national PBL committee and support it in its national level advocacy.[41]

The PEI training model is highly regarded and has been very effective

The training model employed at the PEI continues to be highly effective in building human resource capacity for eye health across the Pacific (although with less of a focus on PNG due

[41] Source: http://www.vision2020australia.org.au/news/2015-05-05/launching-the-lions-national-resource-centre-for-eye-health

to local training opportunities). To the end of 2014, 119 individuals had been awarded diplomas or degrees in eye health from the PEI. Its key strengths include:

- Being regionally based, it enables students to stay within the region and to avoid the high costs associated with training in Australia or New Zealand.
- It has a number of local (Pacific) staff in key positions, including the General Manager and Director.
- Being attached to a well-functioning eye clinic enables effective opportunities for supervised clinical work, and opportunities for MMed trainees to join Pacific outreach teams in their final year of study.
- It facilitates a collegial approach to training, including importantly between doctors and nurses, and these support networks continue post-training.
- Its inclusion, from 2010, of specialised training in diabetic eye care, where it is the only provider in the region.
- Its training is specifically contextualised for the region, focusing on the level of training required and the relevant clinical areas.

The training model aligns with a number of the recommendations in the 2011 PRBPP evaluation, including delivery of the MCEC programme extra-murally so that students can work part-time, and continuing to implement strategies to localise teaching and management roles. For example, the PEI is slowly building the capacity of nurses to be peer tutors, to then become lecturers and ultimately senior lecturers. While it has yet to appoint an education specialist to provide regional curriculum and education oversight, as recommended in the 2011 evaluation, the FHFNZ Academic and Workforce Support Manager does fulfil this role from Auckland.

The PEI training model was described as "the big success story" of HRH training in the Pacific, and several stakeholders suggested it is viewed "with envy" by other departments. Clearly it is highly regarded as a model of regional capacity building and a number of people consider that it could be used as a training model in other health speciality areas.

There is a need for greater collaboration and coordination of training activities in PNG

To the end of 2014 there had been 62 graduates of the one-year ADEC programme delivered by DWU in partnership with FHFNZ. This has had a substantial impact on the supply of trained eye health workers nationally. As discussed earlier, there is a system in place to target trainees in areas where there are the biggest gaps (focus for next year is Bougainville and Western Province for instance) by targeting health service CEOs and medical directors to nominate trainees. Stakeholders were very positive about the nurse training being delivered, and felt that the level of training (8–10 trainees per year) was about right. While this rate of trainees would take around 11 years (excluding attrition and population growth) to meet the WHO target of 1:50,000, the rate was considered sustainable in terms of:

- It would become difficult to justify taking more nurses out of the workforce at any one time for the 12 months of training.

- Greater numbers of graduates would increase the misalignment between nurse and doctor graduates, exacerbating concerns about the adequacy of support nurses were getting once back in the workplace.
- Increasing the number of trainees would require increased training capacity at DWU, including the appointment of an ophthalmologist as head of department.

Nationally, there is a disconnect between the achievements in training eye nurses in Madang and training initiatives at UPNG. This is limiting the ability to extend the achievements in Madang to other professions within the eye health workforce. In turn, it is limiting the impact of the trained eye nurses who are too readily operating in areas with no trained ophthalmologist.

Coupled with a lack of a national HRH plan for eye health (as discussed earlier), this disconnect is due to a lack of collaboration between institutions (UPNG and DWU) and lack of coordination from the NDOH. Clearly there is some context to this divide, not least the territorial nature of the academic institutions. Stakeholders described the decision to establish an eye clinic at MGH and run the ADEC programme from DWU as the driver for the current divide: "Port Moresby are suspicious that DWU wants to take over training of ophthalmologists". A lack of collaboration continues; DWU had not been any part of discussions to establish the resource centre for eye health, which is purported to be a 'national' centre, at UPNG. Meanwhile DWU and MGH indicated their vision to be a hub of excellence in eye health.

Greater coordination and collaboration would help to ensure that new initiatives fit the nation's needs, and not only what works for institutions. At this point, workforce training in PNG is really only addressing the need for mid-level eye care workers. A coordinated approach should consider how best to train health workers from across the spectrum: CHWs, nurses, HEOs and ophthalmologists[42]. There would also be benefit in exploring wider collaboration, and in particular with FNU/PEI and the REC. Previous partnerships between PEI and UPNG resulted in two PNG doctors being trained on attachments at PEI in 2010; but this has not been repeated since. While DWU did not indicate an interest in pursuing a relationship with FNU, UPNG acknowledged the quality of the teaching at PEI and an interest in building these connections which were currently weak. FNU also signalled a willingness to extend its relationships with other institutions on other disciplines, into eye health.

There is an opportunity for institutions to take greater ownership of training programmes

The PEI and FNU[43] have been delivering eye health training under the PRBPP since 2006, while DWU initiated training in 2007. While acknowledging that localisation of training

[42] Nursing Officers and HEOs are currently being trained under the ADEC programme; CHWs were until the NDOH requested that they no longer be accepted onto the programme.

[43] Before 2011 the training was delivered through the Fiji School of Medicine, which then became incorporated into FNU.

programmes takes time, the evaluation team consider that the level of integration of the eye care training programmes into the institutions is disappointing. Training at FNU, 9 years after it commenced, is still largely provided by FHFNZ funded PEI staff and by visiting RANZCO fellows. In Madang, after 8 years, FHFNZ has been successful in getting DWU to pick up the salary of one tutor and the FHFNZ Education Manager, as the Head of Department of Eye Care, is a full member of the DWU Medicine and Health Faculty; although he continues to be employed by FHFNZ. The role of FNU and DWU is largely administrative; advertising the programmes, accrediting courses, conferring qualifications, etc.

DWU indicated a desire to institutionalise the eye care training programme in the longer term and had identified students on the PEI MCEC programme that it would like to take on as tutors. They gave the example of their physio programme that started off as a partnership with the hospital and an NGO but progressively came into the structure of the university over a 4-year period. It is worth noting that DWU is in the process of establishing a medical faculty, which it hopes to launch in 2016.

FNU has discussed the possibility of taking over the eye care programme at some stage, but not in any detail. The university is comfortable with the concept of bringing the programme further into its structure, and in taking on teaching staff, but it does not have the funding. FNU questioned whether the future demand and interest in ophthalmology would be sufficiently strong to justify the cost of recruiting teaching staff and fully integrating eye care as a medical specialty.

The lack of institutionalisation of the training programmes is likely to affect the sustainability of training in the absence of development partner support.

There are gaps in the level of general eye care capacity of primary health workers

A number of stakeholders identified gaps in the eye care training provided to general medical and nursing students. Certainly a lot of the services provided in the eye clinics that the evaluation team visited were first point of call services that could be addressed at a primary facility by staff who had a basic level of eye care training.

In Madang nursing officers get five hours of eye health training; this may be increased from 2016. Trainee doctors at UPNG used to do one week in eye health in their fifth year; and now do 10 weeks combined with surgery. CHWs and other health centre staff in rural areas used to be able to do a 10 week certificate in eye care at DWU which focused on basic eye care and refraction skills, and providing a broad understanding of ocular disease diagnosis, management and referral procedures. This course has been discontinued at the request of the NDOH (largely because CHWs did not have prescribing rights) and a number of stakeholders in PNG lamented its loss.

In the Solomon Islands, stakeholders reported that doctors in rural health centres and provincial hospitals were not confident in using slit-lamps for removing foreign bodies, etc.: "Their basic training is just not up to it". However, interns now do seven weeks in the eye department (up from two weeks) and they expect the basic skills of the younger cohort of doctors will be much improved. Meanwhile, nurses trained in the Solomon's only "get a few

hours on eyes so any training happens informally, in the workplace". Under a government initiative, graduates of the PGDEC are required to provide basic training to primary health workers in their region when they return.

The PRBPP has not targeted eye health training of primary health workers. The 2011 PRBPP evaluation recommended that it strengthen the integration of eye health training into primary health. This has yet to be done in any formal way, other than through initiatives outside the PRBPP such as the Provincial Health Authority funding for primary health worker training in PNG discussed above in section 2.3. The evaluation team agrees that there is a gap in capacity at the primary level, that strategies for addressing this gap need to be included in countries' national eye health plans, and that any response from MFAT needs to be progressed within this context.

There may be an opportunity to base supervised clinical training at the REC

At the time of the evaluation visit, the REC in the Solomon Islands was only in its second month of operation. There was no training taking place at the REC; however, the facility is well-equipped for this and training is on the eye centre's radar. Although it is early days, stakeholders reported a number of potential opportunities, including:

- PEI trainees spending 2–3 months at the REC doing supervised surgical training.
- Doing the same for UPNG trainees, noting that the REC is a UPNG-accredited facility.
- Enabling trainee doctors from the Solomon Islands to do half their ophthalmological training at the REC so that they were not 'lost' from the health system for 4 years while training at PEI.

Any training would need to be supported by visiting specialists, such as RANZCO fellows. Basing some training at the REC would alleviate concerns surrounding the insufficient surgical caseload for students at the PEI, and the poor training environment within the eye department at PMGH.

2.4.3 Workforce support

Workforce support is an integral part of the training models

Workforce support has become integral to the training programmes delivered through the PEI and from Madang. As a FHFNZ representative put it, workforce capacity has "transitioned from working with students to working with graduates". The systems have been developed with support from the FHFNZ Auckland office, and have evolved over time to cater for the increasing number of graduates in the workforce.

The PEI focuses its workforce support on nurses. As the number of graduates has grown, FHFNZ has developed a templated approach to support, and has trained and supports 12 senior nurse coordinators to provide workforce support to more junior nurses. The template provides the nurse coordinator with a plan to assess clinical skills, discuss advocacy, review record keeping, develop skills in clinical audit, and to identify and provide continuing education. Where feasible this assessment and support is provided during a visit to the clinic,

but it can also be done remotely. The coordinators report results back to FHFNZ, where they are analysed and reflected back though annual reflection workshops.

Workforce support is also provided during outreach visits, which has the considerable advantage of: permitting observation and demonstration of clinical practice; assessing knowledge while in theatre; reviewing actual cases and case notes; supporting local staff with direct advocacy with health service managers and health ministry/department staff; and enabling presentations to weekly meetings of a wider group of doctors and nurses (i.e. non eye health specialists).

Support provided during outreach visits also captures any local ophthalmologists, through their attachment to the surgical outreach team. This is especially important for ophthalmologists who are working in isolation, helping to ensure their clinical practice is up to date and providing an opportunity for peer-to-peer learning during this practice. As the number of ophthalmologists grows, reducing the need for surgical outreach, an alternative mechanism for keeping these clinicians up to date with their practice may need to be implemented. Ophthalmologists are also supported to attend the regional PacEYES conferences.

Quality assurance is also a crucial element being provided by the FHFNZ approach. Ophthalmologists submit their surgery results for external scrutiny and review from a regional specialist. Quality of care is extremely important. In cataract surgery for instance, 'success' of the surgery is not assured. International evidence points to an up to 50% failure rate in some settings, and anecdotal reports gathered in the course of this evaluation were of visiting teams at times having high surgical complication rates such that communities had lost confidence in the effectiveness of the service.

From Madang, FHFNZ runs a similar programme for supporting the 57 ADEC graduates in the workplace. In this case, four graduates have been appointed as workforce coordinators, each responsible for supporting a wider team of graduates. The coordinators have regular contact with their group of eye care nurses, and visit each once a year to inspect the clinic, equipment and supplies, meet with the health service manager/CEO to advocate for eye health, and review record keeping and encourage nurses to report data to their CEO. The coordinators report the results of the visits to FHFNZ, which then provides support in addressing any deficits in equipment and supplies.

The workforce support includes an annual workforce support workshop for the graduates, with lectures and presentations aimed at refreshing knowledge and sustaining their interest and motivation for eye health. In 2015 the workshop ran over three days and included presentations from 19 of the graduates and three ophthalmologists, and collation and discussion of data from the clinician's workplaces. Most graduates (40 out of 57 graduates in 2015) come to this workshop, and the FHFNZ Education Manager in Madang writes to CEOs and directors of medical services requesting permission for them to attend. Current DWU trainees also attended the 2015 workshop. In addition, FHFNZ supports 3–4 graduates a year to attend and present at the annual PacEYES conference in Suva.

Stakeholders reported that it is getting difficult to sustain the level of workforce support provided in PNG, as the number of graduates grows. However, they also reported that the coordinators are getting more adept at providing it, as their experience grows.

Two of the strengths of these workforce support models are that they are peer driven, and led by the indigenous workforce. They are, as one stakeholder commented, making "lifelong learners as opposed to one hit wonders".

The potential benefits of workforce support are substantial

The workforce support approaches described above are multi-faceted, covering supervision, professional networking, clinical review, quality assurance, CPD through workshops and conferences, and practical support with equipment and supplies. Taken together, these can be considered as components of a quality system. Such systems are extremely rare in these settings despite their fundamental importance.

Few quality initiatives yield results in short timeframes and progress tends to be incremental over time. While it is too early to determine the impact of this focus on building quality systems, the workforce support model does reflect a number of good practices in quality systems, including:

- The involvement of health workers at different levels; top down approaches (e.g. only involving health service managers and senior ophthalmologists) rarely work.
- Having workforce support coordinators who understand eye health within the cultural and organisational context in which graduates are operating in.
- Adopting a multi-faceted approach.

To realise its potential, there is a need to ensure ongoing workforce support:

- Continues to provide support to the coordinators to ensure that they have the skills to deliver support and to act as 'change agents' and motivators.
- Is prioritised by the local/recipient health service organisation (stakeholders reported some resistance to workforce support by some governments).
- Can be adapted or tailored to local circumstances and needs (i.e. does not get excessively templated).
- Extends to all health workers equally, particularly ophthalmologists operating in provinces/districts which are not so strongly linked in to the FHFNZ network because, for example, the district may have no PEI/DWU graduates, and/or receive no visits from FHFNZ/PEI outreach teams. The evaluation team did, for example, hear about ophthalmologists operating in provinces in PNG that were severely limited by a lack of supplies and, conversely, others that had direct links to supplies provided through FHFNZ.

Workforce support mechanisms should be further localised

The models of workforce support are becoming localised, to the extent that support is largely delivered through peers working within the Pacific. This is commendable. In the case of PNG, the support for ophthalmic nurses is further localised by being delivered through peers in country. In smaller countries in the Pacific this will not always be feasible, and eye care workers, but more specifically ophthalmologists, will continue to reply on support delivered through regional peers. However, the development of in country systems of peer support in

larger countries such as Fiji, Solomon Islands and Vanuatu should be further encouraged, not least to begin to embed support structures within national health systems.

Regional workforce support initiatives need to continue to be localised by building the capacity of local Pacific organisations and programmes. The support RANZCO and SSCSiPs provides to PacEYES to strengthen its programme of CPD is a good example of where this localisation process is happening. Fully transitioning these support structures to Pacific governments to the point that external support is no longer required is expected to take some time; however, building local capacity to lead and coordinate these initiatives should continue to be a focus in the short term.

2.5 Health information

A number of stakeholders considered eye health surveillance data and data management as priority areas for improvement, with a lack of data hampering programme design and thinking. Improved health information was seen as "enabling you to get ahead of the game". This section considers systems and processes for the reporting and use of eye health information, and research on service performance and eye health status.

Eye health service data is not routinely reported in government health information systems

All seven Pacific countries covered by this evaluation have functioning, though not necessarily high performing, national health information systems (HIS); however, eye health interventions are not currently reported in any routine way through these systems. Eye care information is captured, nationally, to varying degrees. For example, in PNG where there is no real leadership in data collection, provincial health services report eye health data into the NDOH every 6 months, but many of these reports are not received. NGO activity is often reported to the national PBL committee, however it does not collate data into an annual report. In Fiji many NGO or private visiting specialist teams report to the divisional hospitals which pass the data on to the MHMS, but this isn't aggregated. Other visiting teams reportedly operate 'below the radar', and do not report any data. In the Solomon Islands data is received quarterly from all government health services and there is an eye care data form integrated into DHIS2, the national HIS, but this is not currently being used effectively.

This all results in limited analysis and use of country level information. Development partners tend to do their own analytical work, for their own purposes, and report this to recipient country governments. But there is no single report which brings all eye health information together and that is consistently reported, either as a standalone report or as part of an integrated health sector report, to clinical directors at provincial and national facilities, the health department CEO or permanent secretary. This inability to readily report to leadership is a concern as it doesn't support visibility and ownership of the service. The Eye Division in the Solomon's MHMS produces an annual report and FHFNZ is currently supporting the Solomon's MHMS to improve the eye care data form and its effective integration with the national HIS (see below).

Data is being analysed and used in health service planning

There appears to be a stronger culture of data collection and use in the Solomon Islands. The evaluation team was very encouraged to see the Ophthalmology Department at the REC accessing and analysing historical data to inform its forward planning. The REC is also developing standardised reporting templates and has introduced specific targets. WDF targets form part of the REC's targets.

The MHMS is currently working on expanding its ADT (admit, discharge, transfer) information system to form a more comprehensive Patient Information/Health Management System. FHFNZ is working with the government and the MHMS to develop a fully integrated eye care module into this platform. The new system is planned to be developed in OpenMRS, an open source electronic medical record system platform with DHIS2 interoperability. Given the poor functionality of many patient and health information systems in the Pacific, there may be the potential to replicate not only the eye care module of the new electronic medical record system in the Solomon's, but the entire backbone of its information system across other Pacific countries. Support for this, may align with MFAT's ICT Investment Priority. There is a need to ensure developments in information systems are driven by government needs, and not just by development partners'. There is also a need to closely monitor and evaluate the use of open source software in the Pacific, in particular to assess whether its use can be effectively and efficiently supported.

The value of integrated information systems will be greater with the growing prevalence of diabetes retinopathy which demands systems that support chronic care management by multi-disciplinary teams.

There are a lack of epidemiological studies and the potential for more operational research to inform health service planning

As discussed in section 2.1.3, the only recent epidemiological study of eye health in the Pacific was in Fiji in 2009. The 2011 PRBPP evaluation recommended consideration be given to conducting a population health based survey in PNG. The draft National Eye Care Strategic Plan 2015–2019 for the Solomon Islands indicates that they plan to complete such a survey by 2019, though no specific funder is identified. FHFNZ has plans to do RAAB surveys in countries with populations over 250,000 over the next 5 years; but this is subject to securing funding. Thirteen people in the IAPB Western Pacific Region have received training in the RAAB methodology, including in PNG and Fiji.

While the evaluation team cited a number of studies on the prevalence and causes of blindness in the Pacific and on the level of services, including research carried out by FHFNZ, there appeared to be less operational research designed to directly inform service planning, including on how lessons from investments in visual impairment services could inform wider health systems issues. There are clearly some innovative operational approaches being developed in the delivery of eye health services (e.g. workforce support models) and development partners have been willing to try new ways of doing things. This is well-suited to problem-solving research and exploration into how to get the system to work better. By way of example only, this might include research on topics such as:

- which parts of the eye service could be better delivered privately

- the cost-effectiveness of diabetic retinopathy treatment
- how to optimise referral pathways between diabetes and eye clinics
- the financial modelling of alternative spectacle supply and distribution systems
- how to fix the problem of a low number of ophthalmology graduates in PNG
- how to extend workforce support models to other health disciplines.

Through its relationships with existing institutions (FNU, UPNG, DWU, Auckland University, etc.), MFAT and FHFNZ could help to build capacity to undertake this type of research in country.

2.6 Service Delivery

The section examines the visual impairment services delivered in the Pacific, considering their coverage, how they are organised and managed, and issues of equity in service delivery.

Services include consultations, surgeries and laser treatment and are delivered at clinics, through outreaches and by visiting specialists

There are three main types of eye care services delivered in the Pacific:

1. **Consultations** make up the bulk of services, and include refraction services, screening/diagnostic services (including for diabetic retinopathy), general eye examinations and treating commonly presenting problems such as trauma, removal of foreign bodies and infections.
2. **Surgeries** are the next most common service, the majority to treat cataracts (which accounted for 81% of all surgeries from PEI outreaches in the seven countries in scope of this evaluation in 2013[44]) followed by pterygium[45] surgeries.
3. **Laser treatment** for the treatment of diabetic retinopathy is less readily available.

Other eye care services provided in parts of the Pacific include public health activities, including raising awareness of visual impairment and services. Public health activities are commonly run in association with WASH programmes for the prevention of trachoma, NCD programmes for the control of diabetes, and as part of World Sight Day. Trachoma elimination programmes have been implemented in the Solomon's and are planned for several other countries in the Pacific.

[44] http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2015/vol-128-no-1420-21-august-2015/6622

[45] A benign growth of the conjunctiva that obstructs vision by growing over the cornea.

Across the Pacific, these services are delivered through three main approaches:

1. The majority of services are provided by teams at **eye clinics**, including the PEI, REC and eye clinic at MGH in Madang, but also dedicated clinics at health service facilities in other countries and at a provincial/divisional level. The level of service depends on the capacity of the local team and the availability of equipment and supplies. Basic primary eye care services may also be available at a sub-provisional/divisional level including at local health centres.
2. **Outreach services** is the next most common delivery approach and includes:
    a. Regional outreaches by the PEI Pacific outreach team.
    b. Outreach services by eye clinic teams within country (e.g. the team at REC or the eye clinic at MGH doing outreaches in other provinces or out to other parts of their own province.
3. Services delivered through **visiting medical specialists** from outside of the region (e.g. RANZCO fellows, services by the Royal Australasian College of Surgeons (RACS) Pacific Islands Programme (PIP), services under the New Zealand MTS, and numerous private and NGO visiting eye care teams). It is difficult to determine the quantum of these services.

A small number of services are delivered through overseas referrals, including outside of the region and to regional centres. It was reported to the evaluation team that a small number of people are referred to the PEI, from elsewhere in the Pacific, for laser treatment.

Service coverage is variable and predominantly supply driven

It is difficult to build a complete picture of service coverage because of the large number of organisations providing services and the variability in reporting. No health ministry/ department was able to provide complete data. This section, therefore, is based on a synthesis of information from a number of sources, and it should be seen as indicative. It is largely based on data presented for services delivered from the eye clinics at the PEI and MGH sourced from *PRBPP Annual Activity Progress Report, January to December 2014,* data provided through key informant interviews, and estimates based on cataract surgical rates and the number of specialists.

In addition to the services below, from July 2006 to June 2015 under the New Zealand MTS (which services Fiji, Kiribati, Tonga, Tuvalu and Vanuatu):

- Five visiting medical teams collectively treated 266 patients with various eye conditions, and supported the training of two ophthalmologists in Tonga and Vanuatu.
- 56 patients were treated for various eye conditions (including bilateral cataracts, retinal detachment, trauma and diabetic retinopathy) under the overseas referral component of the MTS (annually, the number of referrals ranges from 3 to 11).

Papua New Guinea

In 2014, the eye clinic at MGH provided 8,716 consultations (including those provided by the refraction clinic) and performed 549 surgeries. In addition it provided 2,883 consultations

and 449 surgeries, including 214 cataract surgeries, through six outreaches. In 2015 the target is 600 cataract surgeries at MGH and 600 through six outreaches. However, the clinic had no ophthalmologist for several months at the beginning of 2015 and in the 8 months to August had only done 202 surgeries at the clinic. It was, however, exceeding its target of cataract surgeries on outreaches, having completed 158 on the latest outreach. Stakeholders described the outreach programme from Madang as "gap filling" and based around the provision of the workforce support programme, as opposed to meeting the demand for services. Refractive errors/visual acuity make up other 50% of the clinic's work.

In Port Moresby, there were 1,040 cataract surgeries completed at PMGH in 2014. Elsewhere in PNG estimates of service coverage are based on an average expectation of 1,000 cataract surgeries per year per ophthalmologist, and a total of six ophthalmologists (which excludes those in Madang and the National Capital District, i.e. Port Moresby).

In addition to the above, there are a currently unknown (to the evaluation team) number of surgeries performed by other NGOs and visiting teams, including CBM (eye clinic in Goroka plus outreach, however has been without an ophthalmologist for a number of months), RANZCO (3 clinical visits per year), and Youth With a Mission, YWAM (84 cataract surgeries completed in 2013).

Taken together, the services are delivering (optimistically) around 9,000 cataract surgeries a year, for an estimated population of over 270,000 with cataracts (see Table 2). This gives a cataract surgical rate (operations per year per 1 million people) of around 1,181. Specialists we spoke to estimate the rate to be around 800 to 900, while the national PBL committee estimated the 2014 rate to be 716. The immediate target is 1,500, but they would like to lift this to 1,500–2,000.

The main gaps in service coverage include:

- 13 (out of 20) provinces are not covered by locally based ophthalmologists, and while several NGOs do outreach to these provinces, there is no national outreach programme.
- There has reportedly been progress in refractive error services, however these services still have low penetration as they are largely dependent on having access to an ophthalmic nurse.
- Diabetic retinopathy is not being sufficiently addressed. At PMGH the eye clinic only receives around 10 referrals per week from the diabetes clinic and only does laser treatment on an average of 10 patients per week. In Madang the clinic is building up a pilot programme and establishing patient pathways with the MGH diabetes clinic. Currently the eye clinic is only seeing 1:100 patients seen at the diabetes clinic, and people are only presenting when their retinopathy is very advanced. The service does not screen for diabetic eye as part of outreach, but does do a random test on (non-fasting) BSL pre-operatively which provides a window into the diabetes rate. FHFNZ is currently assessing what would be an appropriate level of response to diabetic retinopathy, given in particular the need to stay focused on improving access to high quality cataract surgery, and the need to ensure any response is directly linked to and proportionate to the response to diabetes care more generally.

Fiji

In 2014, the eye clinic at the PEI provided 18,699 consultations (including those provided by the refraction clinic) and performed 1,450 surgeries (approximately 95% of which were for cataracts). In addition it provided 938 consultations and 329 surgeries, including 318 cataract surgeries, through four outreach services to divisional hospitals in Fiji. These outreaches are coordinated by CWM Hospital in the Eastern Division and PEI in the Northern and Western Divisions. Since April 2015, the PEI has been piloting a mobile eye clinic in the Eastern Division. The mobile clinic visits sub-divisional hospitals for a month at a time, providing refractive services, cataract surgery, diabetic retinopathy laser treatment, and dispensing glasses. It is expected to extend into other divisions following a pilot phase.

Some divisional hospitals also do a limited amount of cataract surgeries themselves, and/or with the support of other visiting specialists. From 2016 each divisional hospital will have an ophthalmologist. Data from the MHMS indicates that in the Western Division in 2014, an eye team from the Beeves Foundation[46] completed 140 surgeries (136 of which were for cataracts), while the Sydney Eye Team completed 117 surgeries. In 2015, the Beeves Foundation completed its 24th mission to Fiji and performed 172 surgeries (149 of which were for cataracts), again in the Western Division. Other teams reportedly visit Fiji, including from Korea and Japan, but we have not been able to access data on the services provided.

Specialists engaged in the evaluation felt that the backlog of cataracts had reduced, although there were still a high number to be done in the Northern and Western Divisions. Taken together, the data from 2014 suggests that the services are delivering around 2,000 cataract surgeries a year. This gives a cataract surgical rate (operations per year per 1 million people) of around 2,250, which is around double the rate reported for PNG. FHFNZ calculations, undertaken in collaboration with the MHMS and other key stakeholders, give an estimated rate of 1,907 in 2014.

The PEI operates a diabetic retinopathy service from a dedicated diabetes eye clinic adjacent to the main eye clinic. Referrals to the clinic are made by doctors at the hospital and from primary care GPs. These referral systems are, reportedly, not working well and the diabetes eye team is developing new referral pathways. While the number of people accessing diabetes services is increasing every year, the diabetes eye clinic is seeing less than 10% of those with diabetes.

The PEI diabetes team includes its own outreach team who do two visits per week to sub-divisional hospitals within the Eastern Division. Outreaches are coordinated with special outpatient clinics which screen for diabetes, and then refer straight over to the diabetic eye team for screening for diabetic retinopathy.

[46] The Beeves Foundation is a United States based not-for-profit organisation established to provide vision care to people in Fiji. It operates through a local NGO, Fiji 4 Sight. Since its first mission in 1991, it has performed over 2,500 surgeries and dispensed over 26,000 pairs of glasses.

Solomon Islands

The PEI Pacific outreach team undertook one outreach to the Solomon's in 2014, performing 162 consultations and 57 surgeries (41 of which were for cataracts). With four ophthalmologists and the newly established REC, the PEI outreach team is not planning to send further visiting teams to the Solomon's.

The eye department in the Solomon's provided the evaluation team with data on its coverage over the last 5 years (see Figure 10 below). The service noted the impact of other health issues on volumes, in particular the flooding and diarrhoea and measles outbreaks in 2014 interrupted eye service delivery for 3 months of the year, when the eye facility in the NRH was required to meet the emergency responses.

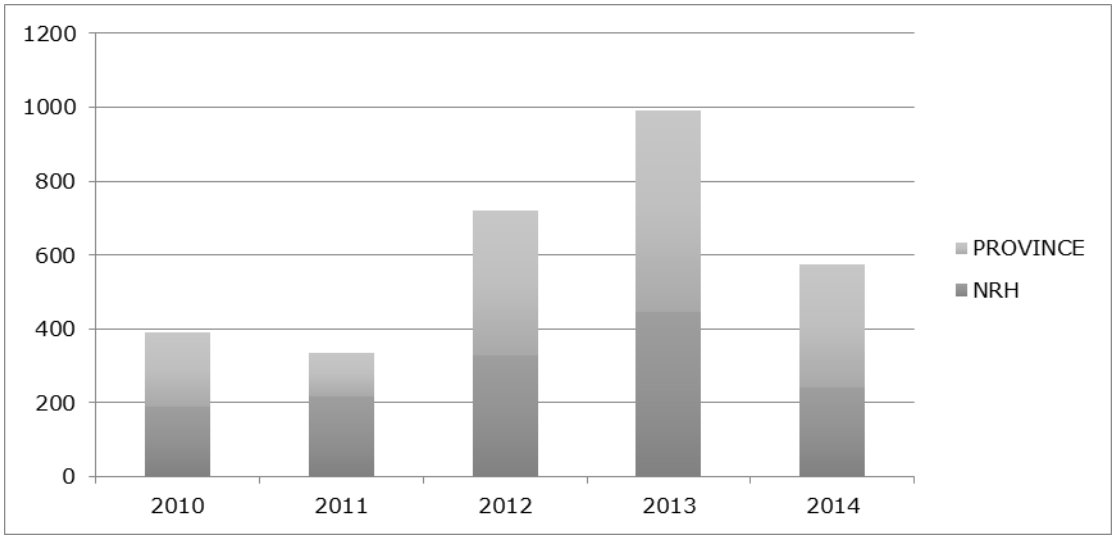

Figure 10: Annual cataract surgeries, 2010 to 2014

Note: 2014 year is to August – not a full financial year

The service has been increasing the number of cataract operations over the last 5 years. Of particular note is the increasing number receiving treatment as part of outreach to provinces. Provincial outreaches have grown from 5–6 per year to 13–14 per year, and typically involve between 60 and 80 surgeries per outreach. The continuation of this trend will be a key indicator as to whether the REC is leading to the centralisation of the service in Honiara (resulting in fewer outreaches), or whether the REC acts as a springboard for improved service access in the provinces, with increased outreach volumes[47]. Other than these outreaches, only basic eye care services are provided by the 22 eye care nurses across the provinces.

[47] The growth to 13–14 outreaches is partly attributable to the increasing number of ophthalmologists in Honiara at the same time as limited access to the operating theatre at the NRH. Access to theatres is no longer an issue since the REC was opened in 2015. Future trends in the number of outreaches will also be influenced by the workforce strategy to grow the number of ophthalmologists based in the provinces.

The new REC facility is seeing high patient volumes, with up to 100 outpatients on some days (up from 40–60 a day at the NRH before the REC). The majority of these cases are for medical eye conditions, not all require specialist intervention.

On the basis of the above data, for the last complete year of data (2013) the Solomon Islands had a cataract surgical rate (operations per year per 1 million people) of around 1,700. FHFNZ, in collaboration with the MHMS and other key stakeholders, calculated a rate of 1,568 in 2014. It is very difficult to tell what the true demand is, and specialist indicated that these numbers are only an indication of supply. A very quick 'back of the envelop' analysis (using the PNG rates shown in Table 2) would suggest that there are around 5,000 cataract blind patients and 20,000 people with cataracts in the Solomon's; against the c.1,000 operations per year.

The diabetic eye service does not have the same reach in the provinces. The three eye nurses trained in diabetic eye care are all based in Honiara and do little active screening outside of the main centre. The last provincial outreach was in 2013. The service relies on patients self-referring, or being referred following a diabetes check in the NRH diabetes clinic or a local health clinic. As one of the diabetic eye nurses put it: "we should be doing more outreach, rather than just sitting here waiting for people to walk in". There is the potential to coordinate diabetic eye outreach with general diabetes outreach services (as is occurring in Fiji), but the eye health workers did not demonstrate a strong appetite for this.

Since the opening of the REC, screening for diabetic retinopathy has moved over from the diabetes clinic in the NRH to the new facility. Several stakeholders were concerned that, as a result, the NRH hand lost a one-stop-shop for diabetic care:

> *"Previously there was easy access, especially for those in wheelchairs … now there is a need to refer to the REC … for patient side it should be a one-stop-shop … sending diabetes patients around the hospital is difficult".*

However, other stakeholders reported that the referral system was not working well, even when the screening occurred in the same clinic: "We have patients accessing the diabetes clinic who are going blind; but they don't get a referral to the eye centre". In 2014, despite having a regular screening programme at the diabetes clinic, only 334 patients were screened for diabetic retinopathy, and laser treatment was provided for only 36 (partly due to the laser machine breaking down).

The eye clinic now has radio spots on diabetic eye and there is a feeling that the REC is helping to raise the profile of eye health more generally. Stakeholders reported screening an average of 20 patients per day at the REC, which is more than double the numbers that they had been screening from the previous diabetes clinic. As well as referrals from the diabetes clinic, they are beginning to see other entry point to diabetic eye, including directly from physicians in other departments.

WDF and Queen Elizabeth Diamond Jubilee Trust diabetic retinopathy interventions are getting underway and are scheduled to run until 2018. These programmes will provide for a full-time local Diabetes Retinopathy Coordinator whose role will include integrating screening and treatment into the general diabetes clinic and outreach services, training of diabetes and primary health workers, and running workshops to improve referral systems. The WDF

programme specifically involves integrating diabetes retinopathy screening with general diabetes screening activity.

Vanuatu, Samoa, Kiribati and Tonga

The volume of PEI outreach services to the Vanuatu, Samoa, Kiribati and Tonga is shown in Table 8, along with an estimate of the cataract surgical rate based on all cataract operations (i.e. not only those undertaken by PEI outreach teams). It shows a large difference in rates, with Kiribati and Tonga having the highest rates in the region and with the exception of PNG, Vanuatu and Samoa having the lowest.

Table 8: PEI Pacific outreach team visits, 2014

Country	Number of outreaches	Consultations	Total surgeries	Cataract surgeries	Cataract surgical rate[48]	Laser treatment
Vanuatu	4	1,040	398	252	1,100	23
Samoa	2	681	265	227	1,192	0
Kiribati	2	794	298	272	2,882	44
Tonga	2	623	214	143	2,377	0

Other services being delivered in these countries include:

- In **Vanuatu**, the local eye specialists provide basic eye care services and the ophthalmologist (who is currently trained to diploma level) undertakes cataract surgeries one day a week in Luganville on Santo. They receive funding from the Presbyterian Church to do a limited number of outreaches, but financial constraints limit the ability of the doctor to do more work from Port Vila. Patients generally have to fund their own travel to Luganville or Port Vila to attend these surgeries, although recently they have accessed some WHO funding from cyclone relief for this purpose. The PEI outreaches take place in Port Villa (Efate), on Santo and on Tanna. The local staff book in surgeries and complicated refractive errors for the PEI outreach team according to where the need is greatest. A specialist team from China visited in 2014, but otherwise the only support received has been from the PEI team.

  Stakeholders reported sufficient surgical services to meet current demands, but were also conscious that the current doctor is about to undertake his MMed training at PEI so will be out of the country for 3 years. It is important to note that under the Vanuatu National Eye Care Programme which ran for 5 years from 2001 and was supported by FHFNZ and co-funded by MFAT, the cataract surgical rate was between 1,260 and 1,650. This, reportedly, has had a positive impact on the backlog of cataracts in Vanuatu.

[48] Calculations undertaken by FHFNZ in collaboration with local ministries of health and other key country and regional stakeholders.

- In **Samoa**, the PEI team visits twice a year for two weeks each. This outreach is funded by the Counties Manukau District Health Board. Stakeholders reported that there are often people still to treat at the end of each day, so had doubts that the demands were being met. Nevertheless, when the current doctor who is in training at PEI returns to Samoa at the end of 2016, there is a feeling that the PEI could reduce its visits to one week each, until the backlog of surgeries is cleared.

  Specialist ophthalmology services are also delivered in Samoa under the RACS PIP. Data from the four teams that have visited over the 3-year period 2012–15, shows an average of 105 consultations and 43 operations per year.

- In **Kiribati**, the local eye care team, which includes an ophthalmologist, is constrained by a lack of functioning equipment. Besides the visits from the PEI outreach team, Kiribati has received one visit per year from specialists under RACS PIP, averaging 322 consultations and 115 operations per year over 2012–15, and has visiting teams from Japan and Taiwan. Stakeholders reported a high demand for diabetic retinopathy service in Kiribati, and suggested the PEI outreach team include the diabetes team on a visit. The WDF has recently approved funding for a diabetic retinopathy screening and treatment programme in 2016.

- **Tonga** is currently largely dependent on outreach services for anything beyond basic eye care and will be for some time with an ophthalmologist in training until the end of 2018. However, the head eye nurse is trained as an HEO, has completed the Post-Graduate Certificate in Diabetes Eye Care, and is able to screen for and treat diabetic retinopathy. Local staff reported that there were a large number of patients waiting for outreach services; but also considered that two visits per year from the PEI, couple with other visiting teams, was sufficient. There is still thought to be a big backlog of cataracts along with an expectation of a huge demand for diabetic retinopathy services, given the high rates of diabetes in Tonga. One stakeholder commented on Tonga's "common sense approach … [in putting] diabetes care and eye care together in the same building".

  RACS PIP specialists had visited Tonga in 2013 and 2014, completing an average of 468 consultations and 75 operations in the weekly visits.

The service response required for diabetic retinopathy is different

Service delivery responses required for diabetes are fundamentally different to that for cataracts. Cataract extraction and lens replacement is a one off intervention with dramatic and immediate impact on the patients' ability to see. It fits well with a stand-alone service delivery model, and from the performance seen in the Pacific this aspect of the service is making very good progress.

The treatment of the eye complications associated with diabetes requires a team approach, centred on the particular needs of the patient. Eye, renal, vascular and limb complications may all occur, singularly or in combination in the one patient. Specialist eye interventions (such as laser treatment) arrest or retard progression of the eye disease, but success is also heavily dependent on the quality of the overall control of the patient's diabetes over the long term. Stakeholders we interviewed were not reporting good control of diabetes: "we do our part but patients need to control". Education and health promotion also form part of the service delivery required for diabetic retinopathy.

Screening and follow up take different pathways depending on a patient's level of diabetic retinopathy. Some patients you would want to follow up 2 weeks after laser treatment, then again in 3 months if it is severe; if it is mild you may leave it for 12 months. These do not fit well with a 'fly in / fly out' model. There is a need to strengthen locally based diabetic retinopathy services:

> *"[Diabetic retinopathy] needs regular follow up … I can't go there [to a province] every 3 or 4 months, and he can't come in that often. Eventually services will need to go there [be based in provinces]."*

Non-government organised and managed services need to be strongly integrated with government service delivery

The government and non-government led service delivery systems are variously integrated. Where they are not integrated and poorly coordinated there is evidence of:

- Non-government services dealing with easier cases and leaving complicated care to government.
- Poor organisation of pre- and post-operative care by non-government visiting services (e.g. last minute trips: 'we're coming next week and need 100 patients lined up for cataracts').
- Visiting teams clashing with other specialist teams (e.g. both requiring a surgical theatre) or coming soon after another ophthalmology team.
- Poor reporting in to government systems (i.e. government health services not knowing what care has been delivered, to whom).

Service integration and coordination worked better when:

- Pacific governments took charge of the service coordination function, either for eye health services as in the Solomon Islands, or better for all medical specialties, as is the case in Fiji.
- When non-government providers shared draft plans of proposed service deliveries with governments well in advance, and agreed these.
- When local health services were able to establish long term relationships with the same provider or programme (e.g. PEI outreach team, VOSO and RACS PIP).

The delivery of regional programmes need to address equity

Throughout the evaluation, a number of stakeholders raised concerns about potential inequities creating by regional investments. These included:

- Concern that MFAT's visual impairment investments are not sufficiently targeted at countries of greatest need.
- Concern that the 'hub and spoke' model of the PRBPP, with the PEI as the hub, could benefit Fiji more than the rest of the Pacific, no matter how hard it tried to work across the region.

- Concern that significant support for centralised service facilities, such as the REC in the Solomon Islands, could exacerbate existing differences in service accessibility (in this case between Honiara and the provinces).

The evaluation team does not have sufficient evidence to judge whether these concerns are contributing to inequity. There are counter-arguments to each of these concerns. For example, investing in centralised facilities could be expected to enhance access to services in peripheral areas too, through the provision of training for primary care workers, strengthening national referral systems, and acting as a catalyst for national screening and treatment programmes. This was part of the Solomon Islands Government's argument for building the REC. In this case, it is too early to validate either argument.

2.7 Medical supplies and equipment

This section assesses how well functioning systems were for supplying eye health equipment and consumables, including the supply of spectacles.

Government supply systems for eye health equipment and consumables are unreliable and deficits are meet by development partners

There was fairly consistent evidence of both a deficit and deteriorated state of specialist and non-specialist equipment, and limited supplies of medicines and medical stores used in eye health across the Pacific. The situation is different in different countries, and on the whole government services are not as well-equipped as non-government managed services. For example:

- The situation in the **Solomon Islands** is relatively favourable. The government provides almost all consumables for eye health through its drugs and supplies budget (which is heavily supported by DFAT). The diabetes clinic at the NRH had a fundus camera for DR screening, funded by DFAT, from 2010 to 2014 (when it broke) but the WDF has since provided a camera to the REC. FHFNZ and the Queen Elizabeth Diamond Jubilee Trust have provided other equipment to the REC including a laser machine. Most provincial hospitals have slit lamps but fewer have ophthalmoscopes. An MDA for trachoma elimination undertaken in 2014 was supported by DFAT, Fred Hollows Foundation Australia and the Queen Elizabeth Diamond Jubilee Trust.
- In **PNG**, the situation at the eye clinic in Madang is very different from the rest of the country. Stakeholders in Madang reported having "good supplies, great stock and equipment" with regular communication from FHFNZ in Auckland asking if they are missing any supplies. FHFNZ reports that it "supplies everything from toilet paper to paracetamol to ensure the clinic continues to function"[49]. The clinic does not currently have a fundus camera but is confident that FHFNZ will be supplying one soon.

[49] PRBPP Phase 2 Annual Report 2011.

Stakeholders reported a contrasting picture elsewhere. PMGH has had a fundus camera on the national medical catalogue list for 10 years, but it has never been purchased. Equipment, such as an ophthalmic surgical microscope, that had initially been sourced through FHF Australia was over 10 years old and "past its best". The clinic itself, which had been refurbished and equipped with support from FHFNZ in 2006, was not observed to be in a good state of repair.

A lack of functioning core equipment was seen as a very practical barrier in most other provinces with an ophthalmologist. For example, in Mt Hagan the specialist was unable to do cataract surgeries because of the deteriorated state of basic surgical equipment. In contrast, limited supplies of consumables in provinces with DWU trained ophthalmic nurses were often addressed through the FHFNZ Auckland office as part of the workforce support network.

In 2011, FHFNZ set up a resource centre in Madang to address the supply of eye care consumables across the country. It expanded an existing spectacle supply system (see next section) to include medications and consumables for eye clinics and surgery. Initially it focused on ADEC graduates, ensuring they had adequate seed stock when they finished training and returned to their provinces; however, it is also open to ophthalmologists. It is used as a back-up for when supplies are low and eye care workers want to avoid protracted government procurement processes; and for sourcing supplies which, while on the NDOH's essential medicines list, are not routinely sourced. It operates on a cost-recovery basis, which is sufficient to include the salary of a supply coordinator.

- In **Fiji**, it was reported that FHFNZ is still supplying over half of the PEI's basic supplies and consumables. The lengthy MHMS procurement process was a key barrier, with the PEI/FHFNZ stepping in to cover costs because of the delays. The CWM Hospital has its own laser machine at the diabetes clinic, however it is in need of repair. There is a laser machine at the PEI. The MHMS has also recently purchased a laser machine for Lambasa Hospital; however, stakeholders did report that the district hospitals lack eye health equipment and are frequently short of consumables and medicines.

Across other countries, equipment and supplies are also variable. Before the PEI regional outreach team visits, it sends a checklist of required supplies to the host country so that it can ensure that the team carries any supplies with them that have not been checked off.

Tonga appears to be comparatively well-organised in terms of equipment and supplies. The eye clinic at the hospital has benefited from established relationships with visiting teams that has resulted in donations of equipment. Nevertheless, the evaluation team also heard that some of the equipment was ageing and not working well. **Vanuatu** is in a similar situation, having had equipment donated by FHFNZ and others, including a fundus camera in August 2015, but at the same time the laser machine is not functioning well and the medicines supply is not consistent.

Alignment between the availability of equipment and of specialists to operate it is an issue. For example, **Samoa** has a laser machine but does not currently have anyone trained to operate it as the country's only ophthalmologist recently left the position. Conversely, on Savai'i there is a nurse trained in diabetic eye care but with no screening equipment. The ophthalmologist in **Kiribati** returned from training in early 2015, but has lacked a fundus

camera and laser machine for screening and treating diabetes retinopathy. FHFNZ has been working to resource her appropriately and with WHO and the Kiribati MHMS has recently ordered a complete suite of diabetic retinopathy equipment. In these instances, in can be difficult for specialists to keep up their skills and the PEI has responded by ensuring that trained staff are involved in outreach teams to other countries.

Overall, the supply of equipment and consumables is donor-dependent. Equipment is provided by a range of donors, in addition to that sourced by government. Where the local workforce has a back-up source of consumables in FHFNZ, the constraints on the system are significantly reduced.

There is a need for improvement in spectacle supply systems

There are multiple systems for the supply and distribution of glasses, including systems run by governments, development partners and private sector optometrists. These cater for the 70–90% of the population with refractive errors whose needs can be addressed through ready-made glasses, and the remaining who require custom-mades. In a number of countries, FHFNZ is establishing a new supply system and it is too early to judge the effectiveness and efficiency of this system. While some systems appear to be functioning adequately, the evaluation team concludes that there is more work to do.

In **PNG**, FHFNZ set up a system to supply low-cost spectacles to the first cohort of ADEC graduates in 2007. These graduates have continued to dispense glasses since. By 2013 this system was running through the resource centre in Madang. In parallel, in 2008 the BHVI helped to establish a local NGO, PNG Eye Care, and together they set up a spectacle supply programme that dispensed glasses through a network of Vision Centres. In 2013 BHVI requested that it run the system that FHFNZ had set up to enable it to run a national system and utilise the expanding eye nurse network of ADEC graduates. FHFNZ agreed to a two-year trial, recognising the advantages of having a single system covering PNG. At the end of the trial period, FHFNZ took back the management of the system it had set up from the resource centre in Madang as there had been problems with supply (time delays and expense). FHFNZ has recently changed the supply system, which is now the same as that for the Solomon Islands discussed below, and the first batch of ready-made glasses had just arrived from China and were being sent to graduates as seed stock at the time of the evaluation.

Stakeholders considered the current systems in PNG to be affordable but, while the distribution was functioning well, access to glasses is largely limited to where there are trained ophthalmic nurses or refractionists. Elsewhere the supply of glasses relies on infrequent outreach visits which are unable to meet the demand:

> *Our locals in remote parts are badly and silently suffer[ing] for eye care services. At times we visit them, very long que[ue] turns up and [we] work beyond time but some do return back to respective houses complaining if we have not check[ed] them.*

Source: PNG Eye Care Facebook page

PNG also has a number of private optometrist supplying glasses in the main centres.

In **Fiji** there is a reasonably well established private optometry market which is directly involved in supplying glasses to government eye care services. The MHMS purchases glasses locally and these are distributed through the PEI, divisional eye clinics and outreach services. Revenue generated through sales is used to purchase further supplies. The PEI has a separate arrangement with Specsavers Australia to provide specialised glasses. These are provided free to those who cannot afford them.

The spectacle supply system in the **Solomon Islands** was discussed earlier, in section 2.3, as it related to health system financing. A summary of the recent experience is:

- A system was set up by the BHVI in 2010 which included the establishment of an optical lab at the NRH. The workshop sourced ready-made glasses, lens blanks which it then cut, edged at fitted into frames (up to a lens power of 6), and custom-mades as required. The lab managed orders and patient payments.
- After a 2 year agreement, the system was transferred to the MHMS to be fully integrated into government services. The lab and system continued to operate providing glasses on a cost-recovery basis for anything between SID 50–80 (except for children for whom they were free).
- Recently there have been problems with re-ordering and stocks are running low. The problem appears to be with government procurement systems, with the revenue from the sale of glasses no longer directly available to purchase further supplies and delays in government procurement.
- In response, the Auckland office of FHFNZ has established a new system which involves bulk purchasing from a supplier in China. The new system is attempting to develop a supply-based model that is more responsive and addresses some of the current delays in the supply chain (from when a person has their visual acuity tested to when they receive glasses).

As noted, the system is too new to evaluate. However, several stakeholders raised concerns with the new system and these need to be addressed as it embeds within the local health system. One concern relates to cost. While FHFNZ has indicated that the suppliers' costs are favourable (around $1 for a pair of spectacles), it was reported to the evaluation team that stock pairs are sold for around SID 90 each (compared to SID 50–80 under the previous system). Another concern relates to the speed of supply. Reportedly, the lab could previously cut, edge and frame a lens and supply it to a customer in around one week. At the time of the evaluation visit, a similar pair of glasses under the new system was taking two weeks to supply. There is also a concern that the optical lab, comprising two trained technicians and equipment, is no longer being fully utilised. One stakeholder expressed concern that the new system was disrupting the flow of services to patients, describing the process as: getting eyes tested at the REC; bringing prescription to the lab to order lenses; going back to the REC to choose frames (which are currently displayed there); then collecting and paying for glasses back at the optical lab.

There are a number of assumptions in these concerns reported from a number of individuals that we have not fully tested. Some of these concerns seem to be 'teething problems' and others could be addressed through fully integrating the old and new systems. The concerns also reflect frustration from stakeholders who were unsure about the status of both systems, unsure whether the new system would actually deliver improvements, felt disengaged from

the process of developing a new system, and, particularly for the staff at the optical lab, were unsure about their professional future. As well as a need to engage with staff in the optical lab, the new system should be closely monitored (particularly as it is being replicated elsewhere). The system in the Solomon Islands certainly needed strengthening, and a move to a supply-based model would seem appropriate. While the existence of a local lab with skilled personnel has some benefits, the efficiency and cost-effectiveness of that model needs to be factored in to any comparative assessment of the new system.

Somewhat surprisingly, there are no private optometrists in Honiara. A number of shops sell ready-mades, for about the same price as the government, but not outside of Honiara. As in PNG, access to glasses in the provinces is largely dependent on access to trained eye care personnel.

3 Evaluation Conclusions

The current situation is a high performing (relative to the rest of the health system) eye health response, in which development partners, including FHFNZ, are directly providing the missing ingredients of successful system functioning. The 'missing middle' of the PNG health system (the gap between health sector plans and their implementation) has previously been described[50], and FHFNZ has successfully, with donor support, supplied the missing elements. These missing elements for effective eye health service functioning, include the creation of a supportive network of relationships, supervisions, supplies, training, quality and collegiality.

This system is largely led and coordinated from outside the national departments/ministries of health, and from outside of the countries themselves. It is very reliant on donor funding support to function.

This section summarises the evaluation team's answers to three of the evaluation questions:

1. To what extent is addressing visual impairment a priority for the Pacific and for the New Zealand Aid Programme? (Relevance)
2. What difference have visual impairment activities made? (Impact)
3. To what extent are the activities and their benefits likely to continue? (Sustainability)

The final evaluation question 'What should MFAT do to support improved eye health outcomes?' is addressed in section 5.

If visual impairment is addressed through an integrated health system response, then yes it is a valid priority

This issue of priority is subjective. As one stakeholder commented in reference to the health sector: "there is no sense of priority because everything is a priority". Is addressing visual impairment on the basis of its impact on the overall burden of disease a priority in the Pacific? Probably not. Is it a valid priority in terms of the role of the New Zealand Aid Programme? It gives New Zealand some visibility (though it gives Fred Hollows and the PEI greater visibility); it taps in to the comparative advantage of a New Zealand NGO; it gets 'quick runs on the board' which is important for generating support; it provides an entry point into addressing diabetes which aligns with the Aid Programme's strategic priority around reducing the impact of NCDs; and it enables the Aid Programme to take on something that is achievable, and to do it very well. Is it a priority for New Zealand's Pacific country partners? On its own, it would never make their priority list; but positioned within something wider—like NCDs, workforce training and support or health system strengthening—it probably would.

[50] Janovsky et. al. (2010) PNG Health SWAp Review: The Missing Middle.

There remains a high demand for visual impairment services in the Pacific, and the ageing population and the growing incidence and prevalence of diabetes means this demand is likely to remain high for some time. The support that has been provided through MFAT and FHFNZ has been a critical response to a need. In the absence of this support, eye health status in the Pacific would deteriorate.

When it has wider system impacts, the New Zealand Aid Programme can clearly justify addressing visual impairment as a priority. The challenge, therefore, is how to extend this very successful investment in eye health to other parts of the system. How to bring a wider set of results, beyond ophthalmology, but without risking what's been achieved to date. Achieving a wider set of results would also bring greater visibility for New Zealand and its Aid Programme.

The activities have built many elements of an effective eye health service

As a development initiative, the impacts of investing in visual impairment activities is interesting; almost the reverse of the norm. Impacts on beneficiaries' lives and on levels of avoidable blindness are apparent immediately. The 'wow' factor when bandages are removed from a patient after a cataract operation is hard to ignore. It clearly makes people's lives substantially better, particularly within contexts where a high level of visual functioning is required to do basic things.

The Fred Hollows Foundation are quick to point out that they are not 'in this game' for the short term. So what do you get from long term investments in visual impairment activities? Ultimately, you get a multi-faceted response to lifting standards, capacity and performance within eye health services at a regional (multi-country) level. These achievements extend across workforce training, service delivery, workforce support (critically) and leadership. Such a multi-dimensional approach is rare in these settings and its achievements need to be considered within a context of poor health system functioning in the Pacific more generally.

Through a well-managed transition to government, over time, the benefits can be sustained

The sustainability of visual impairment activities, following the transfer from development partners to country governments, do not have a strong track-record in the Pacific. The optical lab in Honiara and the Vanuatu National Eye Care Programme are examples where positive benefits have not been adequately sustained.

Integrating donor-supported eye health activities into country systems will support sustainability. This evaluation found variable progress on this:

- There is some way to go to get eye health activities 'on plan', in terms of cemented in national eye health plans that are endorsed and owned by governments.
- Eye health activities are rarely 'on budget', as in costed and visible within national eye health plans and national health department/ministry budget frameworks.
- Eye health activities are not yet 'on report', in terms of reporting in to national health information system indicators.

More positively, many of the visual impairment activities that have been considered in this evaluation have made very significant progress in building local, indigenous capacity and capability. This is, increasingly, enabling countries to address their own needs. However, the long term investment across multiple dimensions of eye health has also created a significant level of dependency on external partners. This needs to be untied slowly.

4 Lessons Learned

Reflecting on the experiences of MFAT and other development partners who have invested in visual impairment activities in the Pacific, the following lessons learned have been identified. Many of the lessons are applicable to other investments in the Pacific.

The Pacific is not a case of 'one size fits all'

The Pacific is diverse. Activities designed for one context may not work the same in another. This presents a challenge for regional programmes like the PRBPP. Within regional programmes, more nuanced approaches are required at a country and/or provincial and district level. Within the diversity of the Pacific, PNG is most exceptional, principally because of its size (it has 9 times as many people as the next most populous country, Fiji, and 72 times as many as Tonga), its disease burden is still dominated by communicable disease and maternal and child health issues, and its level of financial and human resourcing for health is the lowest (per capita) in the region. This needs to be factored in to approaches to targeting need.

MFAT's work benefits from long term relationships with stable partners

MFAT has worked with FHFNZ continuously for 12 years in implementing the PRBPP. FHFNZ brings technical expertise and also stability; it is in the game for the long term. Providing a surgical service in a fly in/ fly out model can be achieved relatively quickly; but building a multi-faceted response to a need, as achieved through the PRBPP (e.g. encompassing training, workforce support, supervision, clinical service delivery etc.), requires long term investment with a stable partner.

Building leadership and country ownership takes time, but is critical for sustainability

Activities are less likely to succeed and be sustained when development partners exit before there is adequate local leadership and ownership of activities in place. Effective leadership can take a generation to develop, but once it's there it is easier to sustain by growing successive leaders. Strong leadership greatly enhances the likelihood of activity benefits continuing beyond development partner support.

Long term success is more likely when activities leverage off established systems and processes

Leveraging off country systems is not always feasible especially in a specialised area where country systems may not exist; however, establishing separate parallel systems creates dependency and a lack of local ownership. Using existing country systems should always be the first option. Separate systems should be as closely coordinated or aligned to country systems as possible, and designed to grow capacity and capability locally to make that transfer possible.

MFAT should maintain active relationships with its implementing partners

MFAT has different mechanisms for investing in development activities. The level of engagement it has or seeks to have with implementing partners depends on a number of factors, including the experience of the partner, and on the strength of trust and the relationship with the partner. FHFNZ is a very active, capable and long term partner, and has a strength in acting independently as well as a proven ability to advocate strongly at the political level. As a result, MFAT does not appear to exercise tight control over FHFNZ as its implementing partner for visual impairment activities. This is understandable. However, even in these more 'hands-off' approaches to partnering, MFAT needs to ensure its partners' actions are coordinated with other donors' programmes, do not risk compromising MFAT's relationships with other donors and development partners, align with New Zealand government policy directions, and promote good aid effectiveness practice. In particular there would be benefit in MFAT, as a funder, playing an active role in discussions and agreements around sustainability arrangements for the activities it supports.

Taking one slice of a system to its limit has some merit; but the approach has more validity if it also looks to have a wider system impact

The evaluation team reflected on the value of the role of MFAT in providing considerable support over a long period of time to one relatively narrow (albeit important) slice of the health system (eye health). On the ground this support can look like a modern, well-resourced, high-achieving eye care facility as an island within a sea of under-resourced, over-stretched, low performing hospital facilities in a poor state of repair. Some stakeholders, reflecting on the REC in the Solomon's, considered this approach risky, for example:

> *"You've got multiple overfill wards at the NRH and a proposed relocation, and New Zealand's / Fred Hollows Foundation's response is to build a beautiful eye care facility next door … there are political risks from the inconsistency; as REC will be run better than the NRH".*

On balance, and when as in this case it responds to a need identified by the recipient government, we feel that there is merit in MFAT supporting this approach; taking all facets of a slice of the system to their limit. Having established credible performance, the additional value comes in being able to transfer approaches and learnings into the host government's control in a graduated manner, and also into other parts of the health system. This is the challenge MFAT faces now. As one stakeholder put it:

> *"Running of vertical programmes for eyes, ears, etc. is important in accessing donor support and funding; but in the longer term integration across the system is vital. [Donors] need to leave behind a system which is well integrated."*

Building systems for health worker networking, training, support, supervision and quality systems is relevant to other MFAT health investment priorities

These elements of a health system (networking, training, support, supervision and quality control) that have been developed under the PRBPP, are frequently missing in health service provision in the Pacific. Building these elements over an extended time period (much longer than particular budget cycles), with a stable and innovative partner are key ingredients of the success. Many of the ways that FHFNZ has achieved this are likely to be transferable to other health priority areas.

There may be an opportunity for FHFNZ to be engaged in developing mechanisms for the provision of these elements of health system strengthening within other health service areas; however, we think that as an organisation, FHFNZ has specialised eye health capabilities and it is unknown whether these could be successfully transferred to system strengthening in another service area. MFAT, in collaboration with other implementation partners as appropriate, should at the very least engage with FHFNZ to further understand how these parts of the system were developed, what worked and what problems they encountered, with the aim of identifying what approaches may be replicable to other health service priorities.

MFAT's activities need to be well-supported by robust monitoring, evaluation and reporting (MER) frameworks

The PRBPP has had a sequence of activity evaluations, including this broader evaluation inclusive of a wider systems review. These have helped to shape adjustments to the activity. What has been less apparent is how effectively activity monitoring information has been reported to Pacific governments. Across all its health investment priorities, MFAT should ensure that it establishes clear and routine reporting processes into governments' health information systems. This can be a challenge given many of these government information systems need strengthening. Improved reporting to government will help raise the visibility of MFAT supported activities, help to increase government ownership of results, and better align activities with government targets and accountabilities.

5 Recommendations

Overall, there has been considerable progress and success in the implementation of MFAT's investments in visual impairment activities in the Pacific. The achievements are the result of a long term investment and relationships, and the experience of its implementation partner, FHFNZ, in building many parts of the eye health system, and in particular workforce training and network building across the region. The activities show considerable merit and are making a difference.

In the right set of circumstances, including where there is strong local leadership and country ownership of eye health services, the need for ongoing development partner support is reducing. In other circumstances, including in regions where the activities and support have had limited reach, there is untapped potential for benefits from future support.

A key theme in this evaluation is that the nature of the visual impairment problem in the Pacific is changing, and the context for the problem in different Pacific countries differs. Population growth and ageing are two dimensions that are strong determinants of the changing need for services. The current NCD epidemic, and the unprecedented levels of conditions such as diabetes, is the other key dimension that is changing. Future investments in eye care need to respond to these changing circumstances. Additionally, the development partner landscape in the Pacific is changing, and while it is not yet clear what this landscape will look like as a result of ongoing DFAT reviews, the response to this evaluation needs to be informed by the latest developments by other donors and development partners in areas such as regional support for specialised clinical services.

The evaluation includes two sets of recommendations; one for any future investments in visual impairment activities; and another set of recommendations for other interventions that align with the New Zealand Aid Programme's strategic priorities and have the potential to address visual impairment. The recommendations are all directed at MFAT. Depending on what role MFAT wants to play in the future, the recommendations will be of more/less relevance to any implementation partner(s)[51].

5.1 Recommendations relating to visual impairment activities

The evaluation recommends:

1. **MFAT continue to support visual impairment activities in the Pacific, but with five key changes** (recommendations 2–6).

[51] The recommendations do not refer to MFAT's current main implementation partner for visual impairment activities, FHFNZ. This does not reflect any views on the performance of FHFNZ; only that we have not been asked to provide recommendations on who MFAT funds.

The evaluation recommends that MFAT should continue to provide support for visual impairment activities. These activities should be provided through partner(s) who have expertise in eye health and expertise in collaboration with governments, and MFAT should provide appropriate leadership and direction for its partner(s). It is possible that some support could be provided through MFAT bilateral support directly into the health sector. Without continued support, a number of the considerable achievements to date are at risk. It is recommended that the support be modified to match the current areas of greatest need (in terms of, for example, deficits in trained workforce, leadership, and service provision) which would have the greatest impact. This would involve targeting countries and activities on the basis of where each country sits in terms of the transition of services to government systems (recommendation 2) and the extent of current support (recommendation 3–6). Some of these recommendations will require a continuation of development partner funding, while others will result in a reduction in the funding required over time.

2. In delivering future activities, MFAT give greater focus to ensuring the transition of activities to Pacific governments and local systems.

Although this is happening to a certain extent anyway and is part of the beneficial effects of training an indigenous workforce which is being deployed to various parts of the Pacific, transition of overall responsibility of eye care services to governments has been piecemeal and slow. A well-managed transition to government, over time, will increase the likelihood of the continuation of services at the same time as requiring reduced development partner support and funding. Transitions to Pacific governments should be supported by building capacity of other local institutions, such as PacEYES.

In order to facilitate the transition, the following steps should be considered:

- For each country, map out the intended end point for different parts of support. This should recognise that some countries, such as the Solomon Islands, may need a relatively shorter timeframe to transition than other countries such as PNG. A suggested order of transition of different components of support, based on ease of transfer to government, is:
    - Establishment of a Ministry/Department of Health coordination point for eye health where this does not exist (in smaller states this would be part of someone's job).
    - Supporting government to coordinate donor and development partner activities within the country, including sharing of information with government on activity and costs. This should be linked to or part of existing donor coordination mechanisms that exist in most countries.
    - Salaries of health care workers in country.
    - Non-specialist supplies and equipment.
    - Reporting systems and indicators inside government HIS.
    - Refractive error services, including its privatisation where applicable.
    - Specialist training for nurses and doctors.
    - Outreach services within the country.
    - Specialist supplies and equipment.
    - Supervision.
    - Networking and conferences.
    - Supportive professional networks.

    - Baseline surveys to assess need (e.g. TADDS).
    - Quality control and systems.
- Identify functions which are best provided regionally (e.g. regional coordination of eye related donor activity, and leadership of eye health quality control).
- Identify functions which are best provided sub-regionally (e.g. specialised outreach services and professional support for countries with populations less than 100,000 that are unlikely to have more than one local ophthalmologist, or have the critical mass to justify training for nurses and doctors and networking and conferences).
- Identify appropriate hubs for these functions (e.g. the existing PEI hub for Fiji, Kiribati, Samoa and Tonga, and a second hub at the REC for PNG, Solomon's and Vanuatu, in recognition that PEI is not the current or most logical hub for PNG which has around three-quarters of the population of the Pacific region). Having two regional hubs, as opposed to the current single hub, will support the move to a more contextualised approach, potentially reduce the need for travel (bringing efficiencies), and build on investments already made (i.e. make full use of the REC facility). It will also maintain the hub model, which has considerable benefits for small, dispersed populations.
- Develop a transition plan for each country covering each of the parts of support and that identifies when and how the functions will be transitioned, and the corresponding cost that the governments will need to plan for. As part of this FHFNZ needs to cost the various components of its work so that the transition to government funding is realistic.
- This recommendation requires that each country's needs be considered separately. This could be done through a bilateral approach or a regional approach, providing the latter allows a degree of flexibility to respond appropriately to the context and needs of each country. The evaluation team is not recommending one approach over another, although duplication of processes in a bilateral model needs to be considered.

3. **Extend the reach of MFAT's support, particularly for training and workforce support, supervision and quality systems, targeting providers and parts of the region that are not currently part of the network that FHFNZ has built.**

   The support provided through the PRBPP is the most comprehensive and systematic support activity for eye health in the region. However, there are still significant populations who are not reached. This applies particularly to **PNG**, where its impact in Madang and adjacent provinces is substantial, its impact in other provinces covered by its network of 57 trained eye care nurses is moderate, while its impact elsewhere, including in Port Moresby, is minimal. This recommendation would involve:

   - Supporting the National Department of Health to lead national eye health policy, planning and coordination.
   - Supporting UPNG and its partners (CBM and Lions Foundation) to build ophthalmology training capacity.

- Working with the National Department of Health and health worker training institutes to consider how best to strengthen basic eye health training for primary care health workers, including CHWs and HEOs, particularly for staff in rural health centres.
- Extending existing workforce support, supervision and quality systems to all specialised eye health workers (i.e. beyond the 57 graduates of the training programme at DWU).
- In partnership with the National Department of Health and the national PBL committee, build on local system for workforce networking, support, supervision and quality systems, including through advocating for PacEYES to extend its coverage in PNG.

Implementing this recommendation is likely to require continued development partner support and funding, with a focus on PNG.

4. **In Fiji, encourage and support the government to strengthen national leadership and coordination for eye health, and ensure equitable access to services across all divisions.**

   The situation in Fiji is complicated by the PEI having a Pacific regional training function and a national service delivery function. Furthermore, the service delivery function includes CWM Hospital staff who do local outreaches in the Eastern Division and PEI staff who focus outreaches in the Northern and Western divisions (in addition to the Pacific outreach team). On top of this, Fiji receives a large number of visiting ophthalmological services. While there is strong leadership within the PEI, there is a need for stronger leadership and coordination at the national level, greater government ownership of eye health, and improved integration of government and non-government services. This recommendation would involve:

   - Supporting the Ministry of Health and Medical Services' capacity to lead national eye health policy, planning and coordination (e.g. establishing a budget line that captured all eye health services, enhancing the use of the national PBL committee as a mechanism for coordinating and integrating government and non-government services, establishing a plan for visiting services and systems to capture data from visiting services).
   - Considering ways to strengthen the integration of CWM Hospital and PEI eye health services (e.g. having eye nurses working under the same employment conditions, and ensuring nurses rotate between different teams of doctors), and ways to improve the integration of the CWM diabetic eye services with the PEI diabetes clinic.
   - Strengthening the reach of the service outside of Suva and the Eastern Division by focusing outreach services on divisions with highest unmet needs (reportedly there is a greater backlog of cataracts in Northern and Western divisions).
   - Considering how best to strengthen basic eye health training for primary care health workers, including CHWs, and staff in sub-divisional hospitals. This would improve treatment at a primary care level and referrals to specialists.

5. **Grow the REC in the Solomon Islands into a truly regional facility that has benefits outside of Honiara and is an asset and exemplar for other parts of the health system.**

   The Solomon Islands has an impressive new eye care facility on top of strong leadership and human resource capability in eye health. Taken together, these are well-positioned to have a wider system impact. This recommendation would involve:

   - Ensuring there is a continuation of supply of services to where the population is in the Solomon's, through outreach service from the REC and/or placement of eye health professionals in the provinces. This responds to the fact that only around 12% of the population of the Solomon Islands lives in Honiara and 18% on Guadalcanal.
   - As discussed in recommendation 2, looking to establish the REC as a hub for eye health services in Solomon Islands, PNG and Vanuatu. This could involve coordinating outreach services to PNG and Vanuatu, and further developing and implementing plans to use the REC as a regional training facility, in particular for clinical attachments for trainee ophthalmologists from UPNG and for Solomon Islanders undertaking training at the PEI.
   - Actively using the REC facility to build a network around NCDs and diabetes (e.g. through holding regular fora with clinicians across the NRH in the meeting/training room, and generally encouraging the use of the facility as a meeting place around NCDs and diabetes).
   - Ensuring NCD training, including that delivered in the provinces, includes a diabetic eye care component as part of the training around diabetes.
   - Considering the integration of the diabetes team into the REC to (re-) establish an integrated diabetes screening service.

6. **Continue to focus on strengthening the provision of comprehensive eye care services, including surgical treatments, general eye care and refractive services.**

   To bring the greatest impact, visual impairment services need to continue to broaden their scope of practice. Changing demographics, in particular from an ageing population, will drive a demand for cataract surgeries and refractive services. In terms of cataract and generalised eye care, the focus should be on extending coverage, continued establishment of country static and local outreach services, coordination of visiting services, and improving service quality, including continuity of care. In terms of refractive errors, there is an opportunity to further establish credible alternative spectacle supply and distribution systems that fit specific country contexts/settings (e.g. population distribution and existing involvement of private optometry sector). This needs to consider efficient delivery and cost structures, as well as how to make supply and distribution sustainable, including through private sector involvement where appropriate. Consideration should also be given to whether there is an opportunity to integrate distribution systems with other low cost, high volume health commodities (e.g. contraceptives).

7. **MFAT consider supporting credible epidemiological approaches to measuring the prevalence and causes of visual impairment in the Pacific, and to modelling of responses to future demand.**

   Limited population level data on visual impairment in the Pacific, coupled with a growing and ageing population and a rising NCD epidemic, limits the ability to develop effective population health interventions. MFAT should consider supporting the implementation of robust methodologies to measure the prevalence, incidence and causes of visual impairment. The Pacific has experience with the RAAB survey methodology, which can be implemented by local staff. Surveillance studies would only be feasible in larger countries (PNG, Fiji, Solomon Islands and Vanuatu) and cost in the range of $150,000 to $200,000 each.

   Once the epidemiological basis is established, MFAT should consider supporting eye care service demand modelling and forecasting studies that identify the future need for standalone service responses (i.e. that focus on eye health) and for integrated service responses (i.e. that address eye health needs through a focus on broader issues such as NCDs or workforce development).

5.2 Recommendations relating to other activities

In considering other New Zealand Aid Programme interventions that have the potential to address visual impairment, or to act as an entry point into addressing visual impairment, the evaluation recommends:

8. **Establish approaches to addressing diabetes retinopathy that are integrated with chronic care management responses to NCDs.**

   This recommendation responds to the need to strengthen access to screening and treatment of diabetic retinopathy. This applies to both static and outreach services – other than in Fiji and the Solomon Islands, diabetic retinopathy services have had little reach. Services targeting diabetic retinopathy need to be delivered as an integral component of a chronic care management approach to NCDs. The response to this recommendation needs to consider:

   - The populations of greatest need (i.e. highest NCD burden).
   - The 'screening' nature of funduscopy – and the ethical requirement that detected cases are effectively treated.
   - The relative cost effectiveness and equity considerations of diabetic retinopathy treatment interventions relative to other NCD interventions.
   - The availability of eye health specialists trained in diabetic eye care and specialist equipment (e.g. fundus cameras and lasers). Currently, appropriately trained staff and equipment are only available in main centres, and patients require multiple treatment episodes.
   - How best to integrate delivery of screening and follow up services with existing systems for NCD screening and management, for example:
     - how to forge connections between eye clinics, diabetes clinics, surgical departments, etc.

- how to leverage off existing parts of the system for chronic care management
- how to build and promote multiple entry points into both general diabetes care and diabetes eye care.

Implementing this recommendation is likely to require continued development partner support and funding, but investments should be integrated or closely aligned with New Zealand Aid Programme's strategic health priority and responses to reduce the impact of NCDs.

9. MFAT consider the potential to support the development and use of information systems for enhancing health service delivery, and in particular for enabling continuity and comprehensive care as part of chronic care management.

Current information systems used in eye health will limit the ability to provide comprehensive care as part of chronic care management which requires an integrated team approach to care. In New Zealand, much of the current focus in chronic care is on how information systems can enable effective practice. There is the potential to replicate effective practice in the use of information systems for chronic care management across the Pacific. The scale-up potential is considerable. MFAT, through its ICT investment priority, could consider how it can best support the use of information technology to deliver chronic care health services.

Appendices

Appendix 1: Abbreviations

The following abbreviations are used in this report.

Abbreviation	Description
ABI	Avoidable Blindness Initiative
ADT	Admit-Discharge-Transfer
BHVI	Brien Holden Vision Institute
CEO	Chief Executive Officer
CHW	Community Health Worker
CPD	Continuing professional development
CWM	Colonial War Memorial Hospital (Fiji)
DALY	Disability – Adjusted Life Years
DFAT	Department of Foreign Affairs and Trade (Australia)
DWU	Divine World University
FHF	Fred Hollows Foundation
FHFNZ	Fred Hollows Foundation New Zealand
FJD	Fijian Dollar
FNU	Fiji National University
HDI	Human Development Index
HIS	Health Information System
HRH	Human resources for health
IAPB	International Agency for the Prevention of Blindness
ICT	Information and communications technology
MCH	Maternal and Child Health
MDA	Mass drug administration
MDG	Millennium Development Goals
MFAT	Ministry of Foreign Affairs and Trade
MHMS	Ministry of Health and Medical Services
MGH	Modilon General Hospital (Madang)
MOH	Ministry of Health
MoU	Memorandum of Understanding
MTS	Medical Treatment Scheme

Abbreviation	Description
NCD	Non-communicable disease
NRH	National Referral Hospital (Honiara)
PacEYES	Pacific Eye Care Society
PBL Committee	Preventable Blindness Committee
PEI	Pacific Eye Institute
PGK	Papua New Guinean Kina
PMGH	Port Moresby General Hospital
PNG	Papua New Guinea
PRBPP	Pacific Regional Blindness Prevention Programme
RAAB	Rapid Assessment of Avoidable Blindness
RACS PIP	Royal Australasian College of Surgeons Pacific Islands Programme
RANZCO	The Royal Australian and New Zealand College of Ophthalmologists
REC	Regional Eye Centre (Solomon Islands)
SDG	Sustainable Development Goals
SID	Solomon Islands Dollar
SSCSiP	Strengthening Specialised Clinical Services in the Pacific
UHC	Universal Health Coverage
UNPG	University of Papua New Guinea
V2020	Vision 2020
WDF	World Diabetes Foundation
WHO	World Health Organization
WPRO	Western Pacific Regional Office (of WHO)

Appendix 2: Evaluation participants

This appendix contains a list of stakeholders who participated in the evaluation.

Organisation	Role/position
Fiji	
Fiji National University	Acting Vice Chancellor
	Director Academic Services
New Zealand High Commission	High Commissioner
	First Secretary (regional Development)
Pacific Eye Institute	Director
	General Manager
CWM Hospital	Head Ophthalmologist
Australian High Commission	Counsellor, Education
	Senior Programme Manager, Fiji Bilateral Health Program
	Senior Program Manager, Pacific Health
	Program Manager, Pacific
SSCSIP	Project Coordinator
	Biomedical Engineering Coordinator
Ministry of Health and Medical Services	Project Officer
PacEYES	Vice President
Papua New Guinea	
New Zealand High Commission	Counsellor, Development
	Development Programme Coordinator
Divine Word University	President
	Dean, Faculty of Medicine and Health
Modilon General Hospital	Director, Medical Services
	Diabetes Eye care
	Eye Nurse
Fred Hollows Foundation New Zealand	Country Director
	Education Manager
	Ophthalmologist
National Department of Health	Chief Ophthalmologist
	Ophthalmologist
University of Papua New Guinea	Deputy Dean School of Medicine

Organisation	Role/position
Solomon Islands	
National Referral Hospital	Head Ophthalmologist
	Lead Diabetic Retinopathy Ophthalmologist
	Optical Workshop
	Nurse in Diabetes Clinic
Ministry of Health and Medical Services	National Eye Care Coordinator
Fred Hollows Foundation	Program Medical Director
	Evaluation and Policy Analyst
New Zealand High Commission	Second Secretary
Australian High Commission	First Secretary
World Health Organization	Manager
Kiribati	
Ministry of Health and Medical Services	Leader of diabetic retinopathy services
Samoa	
National Health Service	PEI student
Vanuatu	
Ministry of Health	Head Eye Nurse
	Head of Eye Department
Tonga	
Ministry of Health	Head Eye Nurse
	Previous Ophthalmologist
Other	
Fred Hollows Foundation New Zealand	Executive Director
	Medical Director
	Academic and Workforce Support Manager
	Programme Strategy Manager
	Development Effectiveness Manager
	Evaluation and Policy Analyst
	Regional Programme Manager
Ministry of Foreign Affairs and Trade	Deputy Director Human Development
	Programme Manager Health
	Development Manager Health
	Development Officer Health
	Development Manager Pacific Development
	Principal Evaluation and Research Manager
Department of Foreign Affairs and Trade (Australia)	Health Policy Officer
	Health Programme Officer

Organisation	Role/position
International Agency for the Prevention of Blindness	Co-Chair, Western Pacific Region
Senior Lecturer, Global Health	Auckland University
CEO	Vision 20/20 Australia

Appendix 3: Development partners involved in visual impairment activities in the Pacific

This following organisations are involved in visual impairment initiatives in the Pacific. This list is not exhaustive.

Organisation	**Involvement**
Brien Holden Vision Institute	The Institute's core business is creating new ways to improve vision outcomes for people whose sight is affected by refractive error. In Papua New Guinea the institute established national spectacles supply system programme and four vision centres. In Samoa the Institute has developed a school vision screening program, upgraded an optical workshop in Apia and have invested in developing local human resources. In Solomon Islands the Institute has contributed to strengthening the national Eye Care Programme and upgrading an eye clinic in Honiara.
Callan Services	Callan Services is a major provider in Papua New Guinea of health and community based rehabilitation services for people with disabilities and inclusive education for children with disabilities. The agency promotes training and the development of quality services. An eye clinic has been established and screening is undertaken to ascertain the presence of any disabilities. Referrals are provided for medications or medical treatment such as cataract operations. Children and families are assisted with transition and integration into schooling and access to vocational training and employment.
CBM	CBM is an international Christian development organisation. In Papua New Guinea CBM runs an eye clinic.
Fiji 4 Sight	Fiji 4 Sight is operated by the Beeve Foundation. It is a non- profit corporation dedicated to providing basic eye care and health care to Fiji. The Foundation is committed to expanding the education of practitioners from Fiji through information exchange and training. The volunteer medical team makes an annual trip to Fiji and provides a range of services free of charge.

Organisation	Involvement
Fred Hollows Foundation Australia	The Foundation works to build capacity in-country, trains local doctors and health workers, builds and upgrades facilities and provides equipment in order to achieve long term sustainable eye care. The Foundation partners with FHFNZ to provide a program in Timor-Leste.
Fred Hollows Foundation New Zealand	The Fred Hollows Foundation NZ works to restore sight and end avoidable blindness in the Pacific Islands, Papua New Guinea and Timor Leste. FHFNZ trains local eye health workers, builds and equips clinics and runs a surgical outreach program into remote communities.
International Agency for the Prevention of Blindness	IAPB works to eliminate the main causes of avoidable blindness and visual impairment by bringing together governments and non-government agencies to plan, develop and implement sustainable eye care programs and advocate for national eye health plans.
Pacific Eye Care Society	PacEYES is the Pacific Eye Care Society comprising of eye care professionals including ophthalmologists, eye doctors and ophthalmic nurses.
PNG Eye Care	PNG Eye Care is a local non-government organisation provided eye care across the region.
Royal Australian and New Zealand College of Ophthalmologists	RANZCO is the medical college responsible for the training and professional development of ophthalmologists in Australia and New Zealand. RANZCO seeks to reduce avoidable blindness in the Pacific through building the capacity of training institutions.
Vision 2020	Vision 2020 is a global initiative for the elimination of avoidable blindness. It was launched jointly by the World Health Organization and the International Agency for the Prevention of Blindness. The initiative promotes inclusive and sustainable eye care systems and strong national health systems.
Volunteer Ophthalmic Services Overseas	VOSO is a charitable trust that is supported by ophthalmologists and optometrists. It undertakes an annual outreach programme, performing cataract surgery and providing glasses. VOSO undertakes outreach in Fiji, Tonga and Papua New Guinea.