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EYES AHEAD- THE STATE OF EYE HEALTH RESEARCH IN THE PACIFIC

(Paper presented by Fred Hollows Foundation)

At a glance

- The purpose of this paper is to report back on the progress of our efforts to better understand the true burden of vision loss in the Pacific in support of integrated eye health planning and budgeting, policy development, and reporting.
- There remains unacceptably high rates of blindness and vision impairment in the Pacific, with approximately 90% being preventable or treatable. Over the coming decade, it is projected that the prevalence of vision loss will markedly increase, and the epidemiology of eye diseases will significantly change due to factors such as rapidly ageing populations, behavioural and lifestyle changes, urbanisation, climate crisis and the increasing non-communicable diseases (NCD).
- The Pacific region has some of the highest rates of NCDs in the world, including diabetes; six out of the ten countries with the highest rates of diabetes are in the Pacific. Diabetic retinopathy, a complication of diabetes, is known to be a major cause of irreversible vision loss and disproportionately affects the working age population.¹ It has been estimated that in some countries in the Pacific up to 69% of people with diabetes have a form of retinopathy, which is more than double the global rate.²
- Blindness and vision loss interferes with ordinary life, adversely affecting quality of life, increasing susceptibility to injuries or accidents, negatively impacting productivity, and dramatically increasing economic and social costs.³ Yet eye health interventions provide among the highest returns on investment for similar health interventions, with each dollar invested returning on average \$20.50 for cataract surgery and \$10.80 for myopia treatment. In Papua New Guinea, the return on investment for cataract surgery is more than 29:1.
- Pacific eye health leaders recognise that strengthening eye health systems require reliable data and contextualised research. They also recognise the importance of eye health and its direct impact on development. To further build this knowledge, eye health research investment is crucial.
- In consultation with targeted Pacific Island Countries, The Fred Hollows Foundation New Zealand (The Foundation) developed the State of Eye Health Research Programme (SoEH) in the Pacific in partnership with the University of Auckland and Te Poutoko Ora a Kiwa – Centre for Pacific and Global Health.

¹ Hou X, Anderson I, Burton-Mckenzie EJ. The value of lost output and cost of illness of noncommunicable diseases in the Pacific. *Health Policy Open*. 2022 Jul 16;3:100073. doi: 10.1016/j.hpopen.2022.100073. PMID: 37383583; PMCID: PMC10297817

² Win Tin ST, Kenilorea G, Gadabu E, Tasserei J, Colagiuri R. The prevalence of diabetes complications and associated risk factors in Pacific Islands countries. *Diabetes Res Clin Pract*. 2014 Jan;103(1):114-8. doi: 10.1016/j.diabres.2013.09.017. Epub 2013 Nov 9. PMID: 24280592

³ National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on Public Health Approaches to Reduce Vision Impairment and Promote Eye Health; Welp A, Woodbury RB, McCoy MA, et al., editors. *Making Eye Health a Population Health Imperative: Vision for Tomorrow*. Washington (DC): National Academies Press (US); 2016 Sep 15. 3, The Impact of Vision Loss. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK402367/>

- The goal of the SoEH is to develop eye health baseline evidence that will assist Pacific governments and health policy makers to better understand their eye health needs and associated economic impacts in support of integrated eye health planning and budgeting, stronger policy development, and reporting.⁴

Recommendations

Pacific Heads of Health are invited to:

1. Support the SoEH Research Programme to generate the evidence for stronger policies, planning decision making, and reporting.
2. Acknowledge that the SoEH Research Programme is an integral part of eye health information system strengthening.
3. Recognise that strategic partnerships are key to the development of research resources and expertise in eye health.

Development partners are invited:

1. To support PICTs in scaling up eye health research by enabling resources and in-country capability.

Current situation

1. In 2016, the World Health Assembly reaffirmed the significance of health information in the broader health systems.⁵ It is globally recognised that health information systems (HIS) are critical to effective, sustainable, and quality healthcare delivery.⁶ In the Pacific, there are ongoing efforts to lift the standards of health information systems to strengthen the reliability and quality of health information. There is also growing commitment from our Pacific health leaders to advance health information and digitisation by allocating resources and infrastructure to continue to progress work on strengthening Pacific Island Countries and Territories (PICTs) health information systems.⁷

2. The SoEH Research Programme will help establish baseline information on eye health systems and understand the population burden of eye disease and service quality. The targeted countries are Fiji, Papua New Guinea, Samoa, Solomon Islands, and Vanuatu. Through this research, PICTs and stakeholders will have access to up-to-date data on their state of eye health to establish, implement, and monitor people-centred eye care (IPEC) health plans and policies that will strengthen and sustain their eye health systems.

3. A key approach of the research process is reciprocal capacity strengthening, where screening and data collection are done by collaborating with country leads across the Pacific region.

State of Eye Health Research Programme Research Methodology

4. The Research Methodology is in three phases over five years (that begun in 2023):

⁴ The research is funded by the New Zealand Ministry of Foreign Affairs and Trade (MFAT), and including The Fred Hollows Foundation NZ and Australia, Lions Club International Foundation (LCIF), JN & HB William

⁵ WHO Health Information Systems in the Pacific at a Glance 2016. Retrieved March 18, 2024, from <https://iris.who.int/bitstream/handle/10665/259091/9789290618195-eng.pdf?sequence=1>

⁶ Ayogebob Epizitone, Smangele Pretty Moyane, Isael Edem Agbehadji, A Systematic Literature Review of Health Information Systems For Healthcare: 11(7), from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10094672/>

⁷ Outcome of the Fifteenth Pacific Health Ministers Meeting. Retrieved March 10, 2024, from [Outcome of the 15th Pacific Health Ministers Meeting 2023.pdf](#)

Phase 1 Situational Analysis

5. This phase involves a thorough desktop review of the extent and nature of eye health and eye health service research in Pacific Island Countries and Territories (PICTs) published from 1980-2023. This is followed by an eye care situational analysis for each country to establish a baseline about the country's eye health system and a population-based survey to estimate the prevalence and causes of vision impairment in people aged 50 years and older; and quality of eye care services.⁸ A health economic analysis exercise using relevant health facility data to estimate the cost of vision impairment and services is also part of this phase.
6. The report for this phase will provide a snapshot of the current climate of eye health systems in the Pacific.
7. **Phases 2 and 3** will gather evidence and outline contextual priorities and key actions necessary for eye health plans and policies to progress integrated people-centred eye care (IPEC).
8. Key findings will be developed and disseminated using targeted communication tools to governments and stakeholders to grow the usability of findings.

Future Vision

9. The desire of Pacific health leaders for robust and functional health information systems that drive planning, policy development, resource mobilisation and innovation is well documented. The SoEH Research Programme reflects this desire that overtime PICTs will have robust evidence on eye health that will inform policy, planning, budgets and other resource allocation (e.g. workforce) decisions that contribute to integrated eye health systems strengthening.

Examples of recent progress

10. The SoEH Research Programme is currently progressing with **Phase 1 (Situational Analysis)**.

Desktop review and findings

11. The desktop review covered 1 610 published literatures on eye health in 22 PICTs from January 1980 to January 2024. Of these, 180 were selected for this review. Half of the included publications were from Papua New Guinea and Fiji, with many smaller Pacific Island Countries having limited data; Five countries (French Polynesia, Palau, Pitcairn Islands, Tokelau, and Wallis & Futuna) had no record of publications and may have been included in the services and reporting of their governing country.
12. Publications about specific conditions focussed mainly on diabetic retinopathy, trachoma, refractive error and cataract. The trends in research topics in the review suggested a potential mismatch between the Pacific's eye health research needs and global priorities. The ongoing interest in diabetic retinopathy across the review period was encouraging given the high prevalence of diabetes in the Pacific. The extensive work on trachoma in recent years was perhaps unexpected, as it was suspected to be low in the region. However, a 2018 review highlighted the lack of quality prevalence data, a gap which was actively filled.

⁸ Eye care in health systems: guide for action. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO

13. The review highlighted that while research and its funding have largely come from organisations outside PICTs, the number of authors with affiliations in the Pacific has been increasing over time, a reflection on growing research capabilities in the region.

Capacity building

14. The Scoping Review also provided an opportunity to train 11 Pacific eye health workers interested in research on how to conduct a literature review (identifying papers, screening, and selection of studies), and to contribute to the analysis and writing of the review.

16. On completion of the Scoping Review, country level analysis on eye health systems, health economics, as well as prevalence and causes of visual impairment was initiated. Solomon Islands and Vanuatu were the first two countries where this took place.

(i) Lessons learned from using Eye Care Situation Analysis Tool (ECSAT) in Solomon Islands

17. ECSAT is aimed at national health policy makers and planners, staff in other national planning bodies, and partners in health development agencies. It provides a “snapshot” of the eye care sector at a time and is designed to describe the current situation on integrated people centred eye care (IPEC), priority areas that need to be addressed in eye care strategic planning, and possible activities to address gaps across the eye care sector.

18. A Technical Working Group (TWG), co-chaired by the National Eye Health Coordinator (Mr Kelvin Jack) and the Regional Eye Centre (REC) Medical Director (Dr John Szetu), was established to support the analysis and reporting of the data collected through ECSAT.⁹ Where there was limited evidence, the team was able to supplement the information needed to provide a realistic picture of their eye health system.

19. The assessment was carried out using a consensus method by the Technical Working Group.¹⁰ This meant that everyone in the TWG must agree on the level of scoring¹¹ on the status of each building block of Solomon Islands eye health system. Guided by the WHO Health System Building Blocks, six areas, as summarised below, were assessed by the TWG:

(i) Leadership and governance

20. The assessment highlighted that the Solomon Islands eye health sector is strong and public health focused. Some key findings are:

- √ Legislation and policy frameworks encompass many aspects of eye care but may require additions and/or updating to also support integration of eye care into wider health policies and plans.
- √ Eye care services are relatively integrated across relevant sectors and programmes with some engagement for planning and coordination of services at the national or subnational level. For example, non-health and other health sector representatives are occasionally involved in the preparation of eye health policies.
- √ Primary eye care services are available via nurse-led primary health care settings throughout the country. There are some frameworks in place to guide the scope and type of eye care delivered at the primary level.

21. Overall, the TWG assessed that leadership and governance on eye health is on track and only needs minor strengthening.

⁹ Membership included 2 Solomon Islands Ophthalmologists and 1 eye care nurses and supported by the University of Auckland and The Foundation.

¹⁰ Fink A, Kosecoff J, Chassin M, Brook RH. Consensus methods: characteristics and guidelines for use. *Am J Public Health*. 1984 Sep;74(9):979-83. doi: 10.2105/ajph.74.9.979. PMID: 6380323; PMCID: PMC1651783

¹¹ *Maturity level scoring* where 1= Needs establishing; 2= Needs major strengthening; 3= Needs minor strengthening; 4= Needs no immediate action

(ii) Service delivery- access

22. The assessment highlighted that more work is needed to better understand inequity in eye care services coverage in Solomon Islands. Some key findings are:

- √ All patients - including the most disadvantaged - have some access to affordable and quality eye care outside ophthalmic clinics and hospitals.
- √ Eye care is moderately integrated within primary care and necessary eye care interventions are delivered some of the time through outreach clinics.
- √ Moderate levels of community-delivered eye care are provided across the country. Community-delivered eye care programmes that meet population needs are limited and vary in the types of services that they provide.
- √ Some paediatric services are available at the Regional Eye Centre (National Referral Hospital) and provincial hospitals, and these are provided at no cost to patients. Populations in rural areas cannot reach services easily-transport to the health facilities and the cost of service are the main barriers.
- √ Cataract surgical services are available but do not reach some of the populations.
- √ Diabetic retina screening is available at all levels (primary, secondary and referral centres) but the treatment services are only available in Honiara and provincial outreach settings. For some patients, lack of transport is a barrier to access.
- √ Refractive and optical services are available but do not reach some of the population. Low-vision and vision rehabilitation services are available only at the Regional Eye Centre (National Referral Hospital) in Honiara.

23. This component was assessed by the TWG as an area where equity across disadvantaged population groups needed strengthening.

(iii) Service delivery- quality

24. The assessment highlighted that Solomon Islands is in progress in the delivery of people centred eye care. Some key findings are:

- √ Primary, secondary, and tertiary eye care services are generally delivered in a timely manner, with only a few waiting lists.
- √ Referrals for further eye care or other types of services are usually smooth and occur at the required frequency, but this can be strengthened to include models of care, referral pathways, two-way clinical referral communication, service directories, case management, and case coordination.
- √ The concept and practice of people-centred care are moderately understood and that there is a low level of people-centred eye care. The delivery of eye care is occasionally tailored and adapted to the needs and priorities of patients and their families.
- √ There is no evidence regarding how the community perceive the quality and effectiveness of eye care services that are available. The eye care workforce however reflects the characteristics required (sex, age, ethnicity, etc.) to deliver socially and culturally appropriate and acceptable services.
- √ Eye care interventions are usually evidence-based. Some national clinical practice guidelines, protocols, standards of care, models of care, and other guidance exist to support the use of evidence-based interventions, and a few more are needed.
- √ There is a moderate level of patient safety. The system has a few mechanisms in place to support delivery of safe care, and eye care is moderately well integrated into these practices. Quality improvement, quality assurance, and/or quality learning systems are not well established across eye care. Actions such as incident reporting are under development.
- √ Multi-level accountability for performance within governing agencies, service providers, and health personnel is moderate. Agencies and individuals have a moderate level of clarity regarding roles and responsibilities.

25. This component was assessed by the TWG as an area that needed minor strengthening.

(iv) Workforce and infrastructure

26. The eye care workforce is experiencing major deficits. Too few personnel are being trained (abroad) to meet basic population needs, even in urban centres. There are severe workforce shortages at the primary level of care. Current graduate numbers are insufficient to meet future demand. Some key findings are:

- √ No policies are in place to regulate the refractive and optical services in the private sector.
- √ Some of the necessary infrastructure for effective eye care services is available, although there are many gaps across facilities. This low level of availability frequently impacts on services provided.
- √ Some of the necessary equipment for effective eye care is available, although there are clear deficiencies in maintenance and coverage across facilities.

27. This component was assessed by the TWG as an area that needed major strengthening.

(v) Financing

28. The assessment highlighted that some key milestones have been met. Some key findings are:

- √ Eye care financing is integrated into most of the financing mechanisms used for the provision of health care.
- √ The eye care financing mechanisms and available expenditure ensure most people in the population are covered. Efforts to achieve “universal” coverage are underway, although not all services are included in the arrangements.
- √ A moderate range of eye care interventions, services, and assistive products that are needed by the population are financed and made available, but a few unmet needs (e.g. spectacles, low-vision devices) remain.
- √ The extent of the financing for eye care interventions results in no or very small out-of-pocket costs, so almost all people in need of eye care can afford it. In addition, some mechanisms (e.g. outreach services) reduce out-of-pocket costs associated with service fees, travel, accommodation, carers, etc., particularly for those living on remote and isolated islands.
- √ Catastrophic health expenditure from eye care is relatively low in the country, however eye care financing is heavily dependent on funding from donors.

29. This component was assessed by the TWG as an area that needed minor strengthening.

(vi) Information

30. The assessment highlighted that this area needs stronger support. Some key findings are:

- √ Health information systems produce a moderate level of reliable reporting on where and what eye care services are available across health services. Some situation assessments, evaluation and reviews, monitoring framework reports, and other targeted reports have been developed.
- √ Health information systems produce some level of reliable and detailed reporting on the utilisation of eye care services within health services.
- √ Health information systems generate some data from some health facilities/programmes regarding the outcomes and quality of care.
- √ Eye research (e.g. population survey) is occasionally conducted and contributes to knowledge regarding prevalence of eye conditions/vision impairment, outcomes, and the quality and efficiency of eye care services in the country.
- √ There is technical capacity in the country for data analysis and report writing.
- √ A moderate amount of information and reports are available regarding the prevalence and trends of eye conditions and vision impairment related to the eye care needs in the population.
- √ There are some ad hoc reports regarding the status, performance, and quality of eye care.

Eye health economic analysis in the Solomon Islands

31. Eye health economic analysis is currently underway in Solomon Islands to analyse the costs of cataract, refractive error and diabetic retinopathy. It will produce evidence on the resources and costs of providing access to eye health services to treat these conditions, which can inform planning and financing decisions.

32. Data is currently collected retrospectively looking at patients treated at the Regional Eye Centre in Solomon Islands. At each site, patient registration records are reviewed to select patients with cataract, refractive error or diabetic retinopathy that were screened, treated or managed in the facility during this study period. Each patient's medical record will be reviewed, and all resources used by the provider to provide this care will be summarised. The protocol can be refined as more information becomes available.

Lessons learned from Vanuatu- Rapid Assessment of Avoidable Blindness Survey (RAAB)

33. The Rapid Assessment of Avoidable Blindness Survey (RAAB) is a population-based survey methodology that is designed to provide a simple, affordable and reliable estimate of the prevalence and causes of vision impairment and blindness among people aged 50 years and older in a defined population.¹²

34. The information derived from the RAAB will provide Vanuatu with the following evidence:

- (i) *Prevalence of visual impairment by category (mild, moderate, severe, blind)* - the prevalence data will inform the Vanuatu Ministry of Health about the magnitude of visual impairment in the population and population subgroups.
- (ii) *Main causes of visual impairment* - this assessment will define the distribution of causes of vision impairment, and whether they are treatable or preventable. It helps identify priority eye conditions for eye care service planning at different levels of the health care system.
- (iii) *Coverage and effective coverage of cataract surgery (adjusted by age and sex)*- informs policy and planning about the met and unmet need for cataract surgical services. Gender-disaggregated effective coverage measures the UHC dimensions of access, quality and equity.
- (iv) *Cataract surgical quality*- this is a measure of poor post-operative visual outcomes in the population which may help inform quality improvement in cataract surgery.
- (v) *Coverage and effective refractive error coverage*- informs policy and planning about the met, under-met and unmet need for refractive error services in Vanuatu. Gender-disaggregated effective coverage measures the UHC dimensions of access, quality and equity.

35. The Vanuatu RAAB Report writing, in collaboration with the Vanuatu Ministry of Health, is currently underway. The Report will inform the review and monitoring of the current Vanuatu National Eye Health Plan and reporting on the WHA indicators.¹³

36. Experience from Vanuatu demonstrated the necessary steps required for undertaking a RAAB Survey, involving the Ministry of Health's Research Committee (research approvals), leadership (signing of the RAAB agreements), eye health staff (5 ophthalmologists, 9 eye care nurses, a RAAB coordinator undertaking the survey); with the development partners/funders (support country activities); and the target population (>50+ age group) in the community.

¹² McCormick I. The rapid assessment of avoidable blindness (RAAB) survey methodology. *Community Eye Health*. 2022;35(117):4. Epub 2023 Jan 30. PMID: 37007832; PMCID: PMC10061257

¹³ World Health Organization. 2022. Report of the 2030 targets on effective coverage of eye care 2030 targets on effective coverage of eye care (ISBN 978-92-4-005800-2). <https://www.who.int/publications/i/item/9789240058002>

37. Ophthalmologists and eye care nurses were expected to undergo two-weeks training prior to undertaking the survey. Each survey team had an ophthalmologist and up to three eye care nurses. In the context of the Vanuatu RAAB, ophthalmologists from other Pacific countries (Fiji, Solomon Islands, Tonga), assisted with data collection to ensure that essential eye services at the main hospital were not disrupted. Nine eye nurses from all six provinces also participated in the survey and guided community engagements and data collection in their provinces. The training, professional and local knowledge, and complementary skill sets provided the ideal platform for robust data collection and triangulation of contextualised information.

38. The methodology enabled a triple benefit on eye health research in the Ni-Vanuatu participating communities; eye health community education, eye screening and data collection. Eye health community education raised awareness of eye care and services that are available in the community, as well as on conditions such as diabetes and its impact on vision. Part of the data collection involved screening the wider community in all the provinces for cataract and diabetes. In so doing, the survey was able to pick up more new cases of diabetes and cataracts in the communities.

39. Visiting the many rural and isolated communities meant the RAAB Survey Teams could reach people who would not otherwise have access to eye care. The teams got to experience first-hand the difficulties of rural communities (e.g., geographical location, cost, isolation, social obligations, cultural norms) that people must negotiate to access a health clinic. This highlighted the importance of a considered approach on the part of health service providers when dealing with rural populations to ensure that patient management plans are practical and achievable.

40. The formation of online chat groups enabled better communications to discuss matters related to the survey, logistics, and updates. The RAAB survey teams demonstrated the importance of having local teams to lead such surveys because of their knowledge and resourcefulness even in difficult situations.

41. A comprehensive report is being prepared for the Government of Vanuatu.

Why urgent action is needed now?

42. The encompassing cost of inaction in eye health is daunting. Vision loss impacts on daily living, it affects quality of life, increases susceptibility to injuries or accidents, negatively impacts productivity and national progress, dramatically increases economic and social costs, and burdens the health care system. Yet eye health interventions provide among the highest returns on investment for similar health interventions, with each dollar invested returning on average \$20.50 for cataract surgery and \$10.80 for myopia treatment.¹⁴ In Papua New Guinea, the return on investment for cataract surgery is more than 29:1.

43. To reduce the magnitude of avoidable vision loss in the Pacific, reliable data on met and unmet eye care needs within integrated health information systems is essential and urgently required to help Pacific governments with better planning and delivery of eye care programmes and services. One of the most crucial elements is to invest in eye health data collection and supportive capability development so that accurate information regarding the prevalence and causes of blindness and vision impairment can be obtained.

44. The Scoping Review as a component of this Research has highlighted the extent of external funding and internationally affiliated research in eye health. Support on genuine collaborative initiatives is needed to ensure that resources are made available in eye health research in the Pacific.

Recommendations

Pacific Heads of Health are invited to:

1. Support the State of Eye Health research to generate the evidence for programme policies, planning decision making and reporting.
2. Acknowledge that the State of Eye of Health research is an integral part of an eye health information system strengthening.
3. Recognise that strategic partnerships are key to the development of resources and expertise in eye health research.

Development partners are invited:

1. To support PICTs in scaling up eye health research by enabling resources and in-country capability.
