

# SUBMISSION

## Consultations on the Pacific Islands Forum 2050 Strategy Department of Foreign Affairs and Trade November 2020

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## Responses to the four key questions published on DFAT's 'Consultations on Pacific Islands Forum 2050 Strategy' webpage

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### 1. What are the major challenges facing our region as we work together to achieve the vision for a Blue Pacific Continent by 2050?

#### GENERAL

Academic experts at the University of Sydney identify biosecurity, food security, climate change, disease control, marine health, animal welfare, disaster response, economic development, good governance and management as the key challenges facing the Pacific region. This submission collates advice received from our experts in response to the four questions. Where separate papers and relevant publications have been provided, we will submit them separately to the Department's Pacific Regional Organisations & Governance Section.

#### EDUCATION

The University stresses the value of systematic and strategic investment in education as vital for realising long-term benefits for Pacific countries.

A singular action that would make a great impact for the region's self-reliance is for the Australian Government to reinstate the leadership educational opportunities, which have effectively ceased by the discontinuation of the Australia Awards Fellowships program and the Endeavour Leadership Program. Both of these programs enabled the University and other Australian tertiary institutions to contribute to the attainment of education and generation of knowledge by established and emerging leaders from the Pacific region. Without these programs to educate and train emerging Pacific Island leaders with the technical skills and expertise to manage public health or sustainability programs, for example, it will be extremely challenging for the visions of the Blue Continent to be realised.

We have also noted a fall in scholarships and international student mobility from the region in recent years. This has been detrimental in terms of our ability to help build capacity and strong and lasting regional relationships and partnerships. We therefore strongly encourage the Government to increase its support for Australia Awards Scholarships for emerging leaders from Pacific countries, so that they are then able to drive meaningful change through the development of robust policies and programs, and by establishing enduring people-to-people links with Australians and future leaders from other countries across the Pacific and beyond. These outcomes all have a long-lasting development benefit in the Pacific.

#### CULTURE & HERITAGE

A separate paper from Dr Amanda Harris from the Conservatorium of Music will be submitted to the Department's Pacific Regional Organisations & Governance Section.

#### SUSTAINABILITY

Pacific Island nations face a range of challenges, such as:

- i) Climate change, especially sea level rise and cyclone frequency
- ii) High energy prices
- iii) High prices of imports, especially food
- iv) Shortage of waste disposal options
- v) Obesity
- vi) Shortage of fresh water
- vii) Small domestic base of skilled labour
- viii) Limited export opportunities
- ix) Fisheries management, especially harmful algal blooms and ciguatera incidence

#### HUMANITARIAN ENGINEERING

- o Growing urbanisation of Pacific island countries
- o Climate change and managing risk
- o Education and training for local economies

## **ENVIRONMENT**

A separate paper from Dr Jacqueline Thomas from the School of Civil Engineering will be submitted to the Department's Pacific Regional Organisations & Governance Section.

## **PUBLIC HEALTH**

A separate paper from Associate Professor Philayrath Phongsavan, Professor Bill Bellew, Jeanie McKenzie, Associate Professor Anne Marie Thow and Dr Lindsey Reece from the School of Public Health will be submitted to the Department's Pacific Regional Organisations & Governance Section.

## **2. How might these challenges impact on our region over the next 30 years to 2050?**

### **SUSTAINABILITY**

These challenges might impact on Pacific Island nations as follows:

- i) Loss of property and productive assets
- ii) Loss of energy security
- iii) Loss of food security, and budget deficits
- iv) Ocean and land pollution from unsafe waste disposal practices
- v) Public health cost increases
- vi) Loss of water security
- vii) Dependence on overseas knowledge and skills
- viii) Untapped revenue and trade
- ix) Loss of domestic food and revenue source

### **HUMANITARIAN ENGINEERING**

- o Direct impact on trade and security
- o Shifting where needs are located

## **ENVIRONMENT**

The culmination of environmental degradation and climate change will be a Pacific Islands population that suffers from increased food insecurity and disease. This will lead to rising levels of poverty, climate refugees, inevitable conflict and fragility of nation-state security.

## **PLANETARY HEALTH**

The Pacific Island Countries (PICs) of Oceania endure a globally disproportionate triple burden of infectious, non-communicable, and climate change induced health impacts. They additionally support among the richest array of cultures and ecosystems in which to understand and respond to the integrative demands of the Sustainable Development Goals (SDGs). As self-contained socio-ecological systems, representing a wide spectrum of critical global challenges, the PICs warrant recognition as a crucial setting for world leading research and intervention at this nexus of health and the environment. This is consistent with the core tenets of the latest [WHO manifesto](#), prescribing a healthy and green recovery from COVID-19, the [Healthy Islands Vision](#), and [Blue Pacific](#) narrative, which guide policy development, investment and action to where co-benefits for economic development, public health and environmental stewardship are most probable. The PICs have demonstrated political commitment to implement essential changes widely and rapidly – if scientifically rigorous and culturally appropriate solutions can be identified. In the global policy arena, PIC leaders have been leading the clarion call for climate action, while intergovernmental agencies are calling for unified [plans of action](#) for health, environment and climate change, particularly in small island states. The most recent [Pacific Islands Heads of Health](#) and [Oceania Planetary Health Fora](#) affirmed an urgent mandate for a consolidated platform for PICs to respond to regional health impacts through uniting and strengthening research and action on human, animal and environmental health, natural resource management, and indigenous local knowledge. This requires a consolidated long-term vision and sufficient funding to drive a truly transformative action research agenda.”

Additional papers from Dr Aaron Jenkins from the School of Public Health will be submitted to the Department's Pacific Regional Organisations & Governance Section.

## **CULTURE & HERITAGE**

We can show our goodwill to these countries by providing support for their cultural agencies. It is not inconceivable that China will step in to do this, but we have established connections and proven reciprocity in our work with various of these agencies. Many of these communities also have strong connections with their diaspora communities resident in Australia.

## **PUBLIC HEALTH**

A separate paper from Associate Professor Philayrath Phongsavan and others from the School of Public Health will be submitted to the Department's Pacific Regional Organisations & Governance Section.

### **3. How might COVID-19 impact on our region's development trajectory to 2050?**

## **NUTRITION**

The COVID-19 pandemic has exposed the vulnerability of the Pacific food system to externalities and has had far-reaching impacts, despite the small number of COVID-19 cases recorded thus far. Measures adopted to mitigate risk from the pandemic have had severe impacts on tourism, remittances, and international trade, among other aspects of the political economy of the region, and are thus impacting on food systems, food security and livelihoods. The interplay between loss of incomes and the availability and affordability of local and imported foods is of particular concern. In a paper (by P. Farrell et al - to be submitted separately to the Department), we examine some of the key pathways of impact on food systems, and identify opportunities to strengthen Pacific food systems during these challenging times.

The great diversity among Pacific Island Countries and Territories in their economies, societies, and agricultural potential will be an important guide to planning interventions and developing scenarios of alternative futures. Bolstering regional production and intraregional trade in a currently import-dependent region could strengthen the regional economy, and provide the health benefits of consuming locally produced and harvested fresh foods – as well as decreasing reliance on global supply chains. However, significant production, processing, and storage challenges remain. These will need to be overcome consistently to influence a move away from shelf-stable foods, particularly during periods when human movement is restricted and during post-disaster recovery.

## **CULTURE & HERITAGE**

COVID-19 has affected our ability to work in the region, to visit and to build relationships. Bandwidth is expensive and slow, making online meetings difficult. Australia could extend broadband networks into these countries from Australia, and allow connection to cultural materials via that broadband.

## **SUSTAINABILITY**

The Coronavirus pandemic will compound and exacerbate some of these challenges, such as Budget deficits (iii), Public health cost increases (v) and Loss of revenue (viii) referred to in our answer to Question 1.

## **ENVIRONMENT**

International tourism is the life-blood of many Pacific Island nations. Sustainable tourism with a focus on eco-tourism (diving, rafting, trekking) is a viable and very valuable industry. Tourism is an industry which, if done well, can make environmental protection very profitable and justifiable. Tourism should be locally run and owned, as much as possible. There needs to be an active move away from the large tourist resorts, where large multinational hotels profit based on business models that exploit, such as Denarau Island in Fiji. COVID-19 and unreasonable travel restrictions in place by Australia and New Zealand has destroyed this industry. Once international travel is returned, there is real risk that profit will come at all costs and further result in the little environmental protections being eroded. There might also be an opportunity to actively shift tourism towards more sustainable eco-tourism practices.

## **HUMANITARIAN ENGINEERING**

COVID-19 will potentially have a significant impact on meeting agreed upon Sustainable Development Goals (SDG) targets. There may also be uneven development – some communities will be able to cope better than others – drawing deeper lines of inequality.

#### 4. How can Pacific Islands Forum members work together to address these challenges, including through closer economic and security linkages that preserve national sovereignty?

##### CULTURE & HERITAGE

A major contribution would be offering broadband via the submarine cable to countries it passes near or through already. Please refer to the separate paper from Dr Amanda Harris from the Conservatorium of Music, submitted to the Department's Pacific Regional Organisations & Governance Section.

##### SUSTAINABILITY

Working together offers a clear benefit to Pacific Island nations, primarily through enhancing the skill base, when small nations can draw on each other's indigenous island-friendly skills and knowledge.

An example for this is the *Sustainable Islands Program* that was conducted at the University of Sydney from 2007 to 2016, funded by DFAT's Australia Awards. Within this Program, community leaders from Pacific Island nations were brought together to exchange experience, learn new skills, and build new networks aimed at:

- Understanding the **energy** metabolism of their islands, and identifying key leverage points for energy and financial savings; training in **accounting** for sustainability.
- Understanding the **fisheries** resources of their islands, and identifying key strategies for managing fisheries reserves and creating new export markets.

Field trip to Norfolk Island, in collaboration with EcoNorfolk and EcoNauru NGOs: Understanding how leadership and initiative can create sustainable, island-friendly solutions for **local employment and entrepreneurship**. Site visits addressing electric power supply, greenhouse gas mitigation, local manufacturing, circular-economy solutions for **waste disposal**.

Unfortunately, the funding for Australia Awards Fellowships and the Endeavour Program were discontinued, and there exists currently no realistic DFAT-funded option for Pacific applicants to undertake specialist or leadership training in Australia.

##### ENVIRONMENT

There needs to be strong policies that place environment at the centre of all economic policies. To achieve this Pacific Island nations will need lines of credit to invest in the development sustainable and green industries. There is a real risk, that the availability of finance will be severely limited post Covid-19. What money is available needs to be invested in environmental protection - the only viable mid-term insurance plan for the Pacific Islands.

##### HUMANITARIAN ENGINEERING

- o Collective voice around common goals and localising development objectives
- o Sharing of best practices and lessons from through forums
- o Advocating for localisation of development

##### ANIMAL HEALTH

Veterinary services in the Pacific Islands are not of a high standard, which exposes them to biosecurity, human health and animal welfare issues. With global warming, these issues are only going to escalate. With appropriate funding and through a collaborative effort involving World Organisation for Animal Health ('OIE'), Australian vet schools, Pacific universities and One Health, this situation could be enhanced.

##### PUBLIC HEALTH

A separate paper from Associate Professor Philayrath Phongsavan, Professor Bill Bellew, Jeanie McKenzie, Associate Professor Anne Marie Thow and Dr Lindsey Reece from the School of Public Health will be submitted to the Department's Pacific Regional Organisations & Governance Section. It notes that the prospect of a prosperous and transformative Blue Pacific Continent by 2050 will hang in the balance if the prevention and control of non-communicable diseases (NCDs) is excluded from being a core part of the Strategy; further, that *Whole-of-government* and *Whole-of-Pacific approaches* are essential.

## Food production, nutrition, lifestyle and health

What are the major challenges facing our region as we work together to achieve the vision for a Blue Pacific Continent by 2050?

The combination of the current obesity and COVID-19 pandemic in the Pacific region will challenge healthcare capacity and economic outcomes. Countries in the Pacific can work together to identify opportunities for change, for example, through community-focused interventions developed through co-design engagement.

How might these challenges impact on our region over the next 30 years to 2050?

The obesity, COVID-19 and climate change syndemic gives no choice but to actively work together to avoid a human and economic crisis. At the same time, this can be viewed as an opportunity to collaborate and innovate.

How might COVID-19 impact on our region's development trajectory to 2050?

Closing borders has been a successful strategy to date; preventing COVID-19 infections in the Pacific, however, this is not sustainable - not only economically but also for health and wellbeing, cultural exchanges and education opportunities. New ways of travelling in the region will have to be put in place, potentially through partnerships between airlines, researchers and public health departments. An example is the Qantas/Charles Perkins Centre partnership that could evolve along those lines; potentially including other airlines doing business in the region.

Solutions need to be identified and tested to allow the region to be an example to the world. For example, I am currently developing a 'transparent face mask for inclusive healthcare' (i.e. designing, prototyping & evaluation of transparent face masks for enhanced communication and protection against COVID-19 infections) and I believe that projects like this one could be made low-cost and available for the effective protection of health care professionals in the region.

Please find below a chapter I was invited to write a few months ago:

**Caillaud C**, Bertrand S, Frayon S, Galy O. Rapid containment strategies help prevent COVID-19 spread. French Pacific Territories. In State Responses to COVID-19: a global snapshot at 1 June 2020. Ed. N Georgeou and C Hawksley. HADRI Western Sydney University 2020.

<https://researchdirect.westernsydney.edu.au/islandora/object/uws%3A56288/datastream/PDF/view>

How can Pacific Islands Forum members work together to address these challenges, including through closer economic and security linkages that preserve national sovereignty?

- The literature points to the importance of collaboration built on co-design and shared practices, for example, initiatives that are meaningful to the communities, that can be scaled-up and are sustainable.
- Building research capacity in the region through education (UG +PG) co-led / co-taught programs in areas of critical needs (eg. health, sustainable agriculture, land and planning) is a mechanism that will create the future leaders for the region. The projects I am co-leading aim to understand how lifestyles and economic transition are affecting health outcomes and to identify key levers that can prevent overweight and obesity.

**Corinne Caillaud | Associate Professor**

Lead "Pacific adolescents' health" Hub, Charles Perkins Centre

Discipline of Biomedical Informatics and Digital Health, School of Medical Sciences

## ***Culture & Heritage***

### **What are the major challenges facing our region as we work together to achieve the vision for a Blue Pacific Continent by 2050?**

The Pacific is a region of immense cultural diversity – a quarter of the world's languages are from this region. Knowledge of languages is crucial for maintaining connection with other cultural practices including song and dance as well as maintenance of traditional knowledge including ecological knowledge. Cultural agencies in the Pacific provide a centralised place for safekeeping of cultural knowledge, but they face the major issue of keeping the primary cultural and historical records their collections safe from deterioration. In Australia, two agencies have been supporting preservation and long-term safekeeping of these records: PARADISEC (Pacific and Regional Archive for Digital Sources in Endangered Cultures) a collaboration between the University of Sydney, ANU and Melbourne, and PAMBU (The Pacific Manuscripts Bureau) at the ANU. We have developed a great deal of trust and goodwill with those agencies by taking analogue tapes and digitising them, returning files to them, and holding copies and their detailed descriptions to allow them to be returned over time in case of disaster (earthquake, cyclone, flood, etc)

### **How might these challenges impact on our region over the next 30 years to 2050?**

We can show our goodwill to these countries by providing support for their cultural agencies. It is not inconceivable that China will step in to do this, but we have established connections and proven reciprocity in our work with various of these agencies. Many of these communities also have strong connections with their diaspora communities resident in Australia.

### **How might COVID-19 impact on our region's development trajectory to 2050?**

COVID has affected our ability to work in the region, to visit and to build relationships. Bandwidth is expensive and slow and so online meetings are not commonly used. Australia could extend broadband networks into these countries from Australia, and allow connection to cultural materials via that broadband, perhaps via AARNet.

### **How can Pacific Islands Forum members work together to address these challenges, including through closer economic and security linkages that preserve national sovereignty?**

A major contribution would be offering broadband via the submarine cable to countries it passes near or through already. For example, we know that in Suva, Fiji, an extension of only a kilometre from the existing node would connect the National Archives there. PARADISEC has built the infrastructure to make digital records of cultural heritage available online (with appropriate restrictions to recognise cultural sensitivities), but lack of connectivity makes this digital infrastructure difficult for Pacific cultural agencies to access.

**DR AMANDA HARRIS**

**Director, PARADISEC Sydney Unit  
Sydney Conservatorium of Music**





Pacific  
Community  
Communauté  
du Pacifique



## REPORT

# ONE HEALTH CONSULTATIVE WORKSHOP

13 April 2018, Denarau, Fiji

With financial support from the Agence française de développement (AFD),  
the Australian Department of Foreign Affairs and Trade (DFAT) and  
the New Zealand Ministry of Foreign Affairs and Trade (MFAT)





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## Executive summary

The first regional workshop on One Health was held at Denarau, Fiji, in April 2018. One Health is a strategic approach to preventing disease that recognises the inter-connectedness of the health of people, animals and their environment. Because around 75 per cent of emerging and re-emerging diseases are zoonoses (that is, transmissible from animals to humans), coordination across the sectors, at both national and regional level, is essential for effective disease prevention.

Representatives from the Pacific human, animal and environmental health sectors came together for the workshop to discuss and prioritise:

- endemic and emerging zoonoses of concern for Pacific Island countries and territories
- key research areas for One Health
- vector control and related national and regional capacities
- requirements for a One Health coordination mechanism

Examples of current cooperation between the human and animal health sectors at national and regional level were discussed. Participants were clear about the challenges for this cooperation. Based on their experience, they stressed the need for building good relationships between those working in the various areas as well as setting up formal coordination mechanisms to ensure systems are in place **before** events, such as a pandemic, occur.

The next steps are for countries to complete their lists of national priorities for zoonotic diseases, identify their research priorities across the human, animal and environmental health sectors, and work towards defining a mechanism to coordinate One Health strategies. Development partners indicated that they will be guided by countries' priorities in supporting One Health activities.

The Pacific Community (SPC) convened the workshop.

## Objectives of One Health workshop

- To bring together multi-sectoral representatives to connect human, animal and environmental health sectors in the context of the One Health approach
- To prioritise endemic and emerging zoonoses of national concern for Pacific Island countries and territories (PICTs)
- To identify key research priorities in the context of One Health that can be used as starting points for the development of research strategies and funding programmes
- To identify existing national and regional capacities and needs on vector control
- To support the creation of a One Health coordination mechanism for the improvement of health outcomes for humans and animals.

## Expected outputs

Preliminary identification of:

- regional priority zoonotic diseases
- key research priorities
- national and regional capacities and needs on vector control
- activities planned for the coming three to five years in the areas of
  - human health
  - animal health
  - environmental health

## Summary of proceedings

### 1. Welcome

Dr Audrey Aumua, Pacific Community (SPC) Deputy Director-General, welcomed participants to the first regional workshop on One Health. She said the impacts of zoonotic diseases in the Pacific are significant and probably underestimated. There are also health risks associated with climate change, including increases in vector-borne and food-borne diseases. Intersectoral cooperation between the human health, animal health and environmental health sectors is necessary to address these threats. It is therefore important to define a regional coordination mechanism for One Health and Dr Aumua said SPC is committed to supporting such a mechanism. She acknowledged the funding provided by partners.

### 2. Opening address

The Hon. Alexander O'Connor, Fiji's Assistant Minister of Health, said he was encouraged to note the objectives of the meeting in bringing together human, animal and environmental health and seeking to develop an enabling environment for One Health. The One Health approach is closely linked to implementing the International Health Regulations (IHR) and the Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies (APSED III), and also to achieving the health targets of the Sustainable Development Goals (SDGs). Fiji has started work on a One Health approach to leptospirosis with support from WHO. The Minister said communication and collaboration are an essential part of One Health, which also requires strengthening relevant agencies. He congratulated the Pacific Public Health Surveillance Network (PPHSN) for its work in the region and the Pacific Community (SPC) for convening the workshop.

### 3. Introduction

Participants introduced themselves and their sector background. The majority of participants were from the human health sector. The secretariat said the workshop would decide on key activities to take One Health forward in the first year.

#### **3.1 Lessons learned in the One Health approach – SPC's experience in implementing the Pacific Regional Influenza Pandemic Preparedness Project (PRIPPP)**

PRIPPP was a regional public health project to improve preparedness for and response to highly pathogenic avian influenza (H5N1) in both the animal and human health sectors. It was later broadened to address infectious diseases more generally and to take an integrated approach to surveillance. The project, which covered the years 2006 to 2011, involved 22 PICTs. It focused on laboratory strengthening in PICTs and improving capacity in animal health. For example, to make up for a chronic lack of veterinarians in the region, up to 600 paravets have now been trained in PICTs. The Pacific Animal Health Laboratory Network (PAHLNet), a group of animal health laboratories in the Pacific region, was organised through PRIPPP. The Data for Decision Making (DDM) programme also began under PRIPPP.

The main lessons learned from the project were that specific efforts were needed to sustain the strengthening that occurred during its implementation, including integration of different health sectors and mechanisms to support collaboration. An evaluation by DFAT (Department of Foreign Affairs and Trade, Australia) found that PRIPPP focused on technical issues but not sufficiently on underlying operational systems (policy, coordination, finance), which meant many of the gains made could not be sustained.

## 3.2 Animal health sector

### *One Welfare approach*

One Welfare is based on the link between animal welfare and human welfare and the dependence of both on a well-functioning ecological environment. It thus fits into the One Health approach. SPC, through its Land Resources Division (LRD), will work towards embedding animal welfare in One Health through a project proposal to improve livestock husbandry practices and develop a regional animal welfare code of practice. There is scope to promote the role of paravets in implementing national anti-microbial resistance (AMR) surveys and advocating proper use of veterinary products.

## 4. Scene setting

### 4.1 Pacific health security, One Health, and lessons learnt from Ebola, MERS<sup>1</sup> and other emerging infectious diseases (Dr Angela Merianos, WHO)

Seventy-five percent of emerging infectious disease are zoonoses. In the Pacific, vector-borne diseases, brucellosis, leptospirosis and seafood intoxication are examples of diseases or toxins that originate in animals, with transmission influenced by environmental factors. The rise of multidrug resistant organisms is also important. A One Health approach focuses on the interface between humans (and behaviours), animals and ecology. Human behaviour drives epidemics, e.g. by encroaching into new ecological niches or misusing antibiotics. Many events are unexpected. It is therefore important to establish intersectoral relationships and put systems in place before events such as pandemic influenza occur. Prevention and control of emerging zoonoses is a key focus of APSED, which has been the roadmap for implementing the IHR since 2005. The approach is also embedded in the Healthy Islands framework, which aligns with the IHR. 'Planetary Health' is a new paradigm that goes beyond One Health. It is based on the concept that 'damaging the planet damages human health'.

One Health is defined as 'the collaborative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals and our environment' – American Veterinary Medical Association

### 4.2 EcoHealth and One Health (Dr Aaron Jenkins – University of Sydney)

EcoHealth uses a systems approach to promote the health of people, animals and ecosystems in the context of social and ecological interactions. The key approaches are conservation and ecosystem management, veterinary medicine, human medicine, public health practice, rural and urban development and planning. EcoHealth tends to encompass more social science and humanities disciplines (including anthropology) than One Health. The concept of Planetary Health is even broader.

'To improve health and well-being through the prevention of risks and the mitigation of effects of crises that originate at the interface between humans, animals, and their various environments' – One Health Global Network

A key theme of all these approaches is the interdependence of the health of ecosystems and humans and other species and therefore the need to consider more holistic approaches to public health. The value of the EcoHealth approach can be illustrated by good water catchment management. Integrated water-related disease surveillance combines health, water safety, sanitation and land use. In contrast, environmental destruction increases susceptibility to flooding, and has impacts including food safety risks and spread of infection. A holistic approach combines the strengths of several disciplines and is a practical and cost-effective way to make progress, including on many of the SDGs.

<sup>1</sup> Middle East Respiratory Syndrome

#### **4.3 Fiji's approach to One Health – Human, animal and environment interface (Dr Eric Rafai, Fiji Ministry of Health and Medical Services)**

Analysis of the current situation for One Health in Fiji and worldwide has identified that the countries that have been successful in improving intersectoral collaboration have established formal national-level committees jointly led by the Ministries of Health and Agriculture, with membership extended to a broader group of stakeholders. There is a need to show political leaders how One Health will be implemented. Fiji already has some mechanisms in place, such as the Multi-Agency Task Group and National Antimicrobial Resistance Strategy. Key zoonotic priorities for Fiji are leptospirosis, brucellosis, bovine TB and pandemic influenza, but others such as bat viruses are not being addressed. Needs in relation to One Health include a forum for communication and collaboration, integrated policy development for infectious disease surveillance and control, better capacity in animal health agencies and public health surveillance and response, and baseline data on AMR. Several demonstration projects – on leptospirosis, bovine and human TB, ciguatera and AMR – are being conducted through collaboration between sectors, such as the Ministries of Health and Agriculture, and other agencies.

#### **4.4 Putting One Health into practice – Associate Professor Simon Reid, University of Queensland**

There is no blueprint for achieving One Health. Solutions can lie in thinking differently, e.g. using systems thinking. Zoonoses can be thought of as the outcome of interactions between the human system, animal system and ecosystem. All have their own behavior. Systems thinking is a useful tool for looking at the bigger picture and at the interrelationship between systems and different parts of systems. It also considers the effects of interventions on these different parts. For example, systems thinking was used to address leptospirosis transmission in Fiji (Reid, Rodney et al. 2017). Steps included looking at the problem through various technical areas and then considering why people would want to address the problem in their separate systems, recognising that the only thing that mattered to all stakeholders was human morbidity and mortality. To understand the system better, researchers also looked at policy frameworks. They found the policy environment was confused with different agencies having overlapping mandates. Key agencies included the Ministry of Health and Medical Services, the Biosecurity Authority, the Animal Health and Production Division, and the Dept of the Environment. Integration between these sectors can be achieved by using policy levers. WHO's new JEE<sup>2</sup> requires ministries of health to report on other sectors and capacities, thus forcing health to interact with other sectors. However, despite discussion of collaboration, there is not much evidence in research in various disciplines. Now the public health sector is reaching out to other disciplines. A good start to collaboration is to get to know counterparts in other sectors. Collaboration may begin at the technical level but then must move to the policy-making level. (A useful resource is the WHO publication, 'Systems thinking for health system strengthening'.<sup>3</sup>)

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<sup>2</sup> Joint External Evaluation [of International Health Regulations implementation].

<sup>3</sup> de Savigny, D. and Taghreed, A. (eds). 2009. Systems thinking for health systems strengthening. Alliance for Health Policy and Systems Research, WHO. 107 pp.

#### 4.5. Comments and questions

Cook Islands took part in paravet training in 2000 and asked if there was an opportunity to renew this participation. There is already cooperation between sectors in Cook Islands, but the Ministry of Health has more resources than the Ministry of Agriculture.

SPC said it could resume paravet training if countries fund it, as is happening in Fiji and Vanuatu (the original funding under PRIPPP has ended). The goal is for the training to be institutionalised in countries. SPC has manuals and workbooks available for countries to use and can provide mentoring.

The World Bank commented that the DFAT review of PRIPPP and similar projects suggests that even though a regional approach or mechanism may be considered necessary for some issues, it seems to be the most fragile or difficult to sustain. More debate, perhaps by the present group, is required about whether regional, national or multi-country approaches, or cross-institutional mechanisms, should be considered and how initiatives can be sustained. It is important to avoid funding becoming fragmented.

The Director of SPC's Land Resources Division said the recent FAO regional conference focused on systems, including food systems, and processes. However, experience shows that systems approaches do not always lead to useful outcomes. In agriculture, some systems have wide boundaries and involve many communities, e.g. watershed management has been discussed for many years, but the problem is not yet resolved. The institutional mechanism for One Health must consider the grassroots and must be pragmatic in targeting outcomes.

Fiji agreed that system perspectives must consider what helps the population in addressing zoonotic diseases effectively. In Fiji, the health sector programme (funded by DFAT) focuses on working with civil society organizations (CSOs), which engage across sectors and communities. Lack of animal health capacity is an issue in most PICTs. Reducing fatalities associated with zoonoses, such as leptospirosis, requires interventions at the grassroots level.

Tokelau commented on the expectation in Tokelau that community consultation is part of policy development. This is beneficial but time consuming. She asked how Fiji dealt with consultation.

Fiji is working on a policy document on engagement with CSOs. Government sets the regulatory environment and CSOs, among others, implement initiatives, often very successfully. PICTs have to look at what actually reduces fatalities from zoonoses. There are many research questions that need answers.

Cook Islands said PRIPPP had helped build pandemic preparedness. However, she had seen from her work in the New Zealand health system (as an Auckland-based medical officer) that the incidence of diseases such as typhoid, shigella, mumps and dengue associated with travel to and from PICTs reflects inadequate public health infrastructure and systems in PICTs. She asked donors to consider the urgent need for development of public health capacity, noting that PICTs may have different drivers for improving public health. It is urgent to address diseases such as leptospirosis and dengue, including to protect economies dependent on tourism.

## 5. Parallel workshops

Participants were assigned to one of five groups (Melanesia, Micronesia, Polynesia, French-speaking PICTs, and Partners) to discuss three topics. Partners discussed current activities and resources available for One Health.

### Workshop 1 – Prioritising zoonoses of regional concern

SPC noted that PICTs had already received a tool to identify *national* priority diseases (not restricted to zoonotic diseases). Representatives were asked to complete their lists and email the information to SPC.

Participants were asked to discuss a list of *regional* disease priorities, using the following weighting/criteria as agreed on by the meeting:

Criteria for prioritisation of diseases	Weighting
Severity of illness in humans	5
Ability to prevent or control the disease in country	4
Economic burden of disease	3
Capacity to collaborate	2
Disease trend in last 5 years	1

#### *Feedback from groups*

The groups reported back with diverse lists, reflecting their different island groupings and also the professional background of group participants. Another factor in the diversity of the lists was the interpretation of the criteria. SPC will further analyse the lists to determine common priorities.

### Workshop 2 – Identification of research priorities

#### *Feedback from group discussion*

- Funding is often restricted to human health – broader application of funding is needed in a One Health approach.
- More training in holistic approaches is required.
- There is a lack of coordination and collaborative mechanisms for integrated research. Academia could have more involvement.
- In New Zealand, funding for health/Pacific research is coordinated. A similar strategic research coordination mechanism could apply in the region.
- It is important for the region to 'own its research'. Capacity building opportunities for Pacific researchers are needed, particularly in countries that do not have their own universities. Any research must be linked to tertiary institutions that have ethics and other processes in place.
- Local institutions should be empowered to take the lead in One Health research.



- SPC noted that the Pacific Health Research Council is currently housed (or rather ‘hibernating’) in Cook Islands. It may be possible to revive the mechanism, especially for countries that do not have their own mechanism. SPC has research connections with several universities in Australia and New Zealand and is seeking to connect with additional regional universities, such as the University of Guam.
- Existing training initiatives include Data for Decision Making (DDM), which focuses on epidemiology. DDM is provided through SPC and Fiji National University (FNU). TB-related capacity building is available through James Cook University. These programmes also use regional academic partners.
- In Fiji, research priorities target clear health outcomes. One Health requires an expansion of those priorities.
- Eighty percent of laboratories in the region focus on human health and clinical diagnosis. Capacity for environmental health in PICTs must be put in place along with strengthening of animal health laboratories. These laboratories can support research.
- Storage of samples, especially long-term storage, is a challenge. It is important to store samples for future reference (for 10 years), e.g. for arboviruses. Only a few labs have capacity to store samples at minus 80 degrees. PICTs need to look at their ability to store samples for future research.
- PIHOA said about 11 labs in the North Pacific have minus 70 freezers. In Palau, bacterial isolates have been stored successfully for 5 years. These facilities could be shared with animal health labs. To provide access to reference laboratories, PIHOA maintains a subregional sample shipping system to which countries contribute USD 3000 per year. Under a One Health approach, other sectors could share in this mechanism. Tertiary institutes could introduce One Health courses to their academic programmes.
- FNU has developed a course on climate change and human health, based on the WHO publication, and has now included One Health in its curriculum. FNU asked countries to raise issues that the university could address through academic engagement and to be specific about the type of engagement required, e.g. training, research support.

### **Workshop 3 – Identification of vector control capacities**

#### *Feedback from group discussion*

Vector control/surveillance shows mixed capacity across the region. Most PICTs have accessed external training, e.g. in Singapore and Malaysia. Fiji and Guam have better capacity. Some PICTs rely on ‘learning on the job’. Some countries are involved in research projects, e.g. looking at biological control of mosquitoes. Mosquitoes are regarded as the most important vectors, but other vectors must also be considered. Sustainability of gains and resources is a concern when projects finish.

Issues for vector control include:

- lack of entomology capacity in PICTs. This is the most serious issue. In addition to identification, entomologists provide valuable input to vector management strategies.
- the increasing mobility of people. New entry ports are opening in remote areas, requiring vector surveillance and transport of biosecurity staff to those areas.
- the need for ongoing formal training – usually only small numbers of people can be trained and staff turnover is a problem
- introduction of new methodologies for vector control, and ensuring appropriate infrastructure in countries

Capacity in the three French PICTs is good, though slightly weaker in Wallis and Futuna. Expertise in French countries can contribute to capacity building in other PICTs.

PIHOA now has medical entomology capacity. A medical entomologist, funded by CDC, is co-located with PIHOA in Guam, and another is located in American Samoa to work on filariasis. In Guam, a mosquito lab is being built and a mosquito surveillance framework is being drafted for North Pacific countries. PIHOA hopes these entomologists can be included in regional discussions of One Health.

PICTs can access lab testing / diagnostic capacity in other countries using existing channels (direct flights) for transport of samples.

Vector control lacks longer-term responses to systems or activities that cause flooding and standing water, such as deforestation and road building. Approaches need to go beyond short-term interventions at the household level, e.g. removing stagnant water sources.

Holistic approaches are important. Different ministries and local bodies are responsible for aspects of human habitation. They need to collaborate to ensure a better environment for human health, e.g. by looking at rural-urban migration, drainage, and import of low-quality goods, which create trash. Informal settlements need services such as drainage and rubbish collection.

Not all PICTs share the same challenges, e.g. in the context of controlling vectors, Tokelau has the advantage of remoteness and one entry point. With a small island and small population, eradication of mosquitoes may be possible – if researchers would like to take this challenge on.

### **Regional resources for health – Partners group**

#### *Feedback from group*

Partners presented their capacity in One Health and areas of interest for providing support.

SPC is a partner in global health security/ APSED III and recently received AFD<sup>4</sup> funding for health security through PPHSN, much of which can apply to One Health. SPC has a memorandum of understanding (MOU) with the International Atomic Energy Agency and is developing an MOU with CDC.

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<sup>4</sup> Agence Française de Développement – French Development Agency.

CDC is engaging more in the wider Pacific and may be able to provide specific technical assistance related to One Health. Current work focuses on preparedness, regional lab support, and surveillance systems development. CDC has a cooperative agreement with PIHOA to implement initiatives in the region and is seeking to establish partnerships with local institutions on environmental health.

PIHOA's activities include lab strengthening, working with the Guam public health lab to provide a regional reference lab. A food safety lab and mosquito lab are being built at the Guam Dept of Public Health. Surveillance systems are being strengthened with PPHSN partners. PIHOA is working with local colleges to build environmental health degree programmes, and a regional medical entomologist is now based on Guam.

The World Bank tripled its budget for the Pacific in 2018. Each country has a set allocation. One Health related requests to support activities implemented through Ministries of Finance, Agriculture and Environment must be made through Ministries of Finance. Direct technical assistance for health-related financing and efficiency is available for selected PICTs (PNG, Samoa, Solomon Islands, Vanuatu, Kiribati and Marshall Islands).

WHO has a tripartite agreement with FAO and OIE (World Organisation for Animal Health) to build surveillance, risk assessment and field operations (e.g. for zoonotic outbreaks). Technical assistance is available for strengthening emergency management and funds are available to help with disasters. WHO's Health and Environment programme focuses on climate change. WHO also runs AMR stewardship workshops, supports lab strengthening and procurement, and is working on global emerging diseases.

DFAT is currently undertaking a scoping mission for projects on animal health and environmental health in Fiji, Samoa, PNG and Solomon Islands. Health Security officers (Australian Health Volunteers International) are being located in four sites in the region. University grants are available for capacity building and research projects with Pacific partners. DFAT also provides the finance secretariat function for PaHSeC and SPC health security activities.

The partners said PICT priorities from the meeting would flow into a planning process to support One Health related activities. They advised countries to be aware of, provide guidance to, and take advantage of the support offered by partners.

## **Comments**

SPC said it was exciting to hear that DFAT and the World Bank have projects in animal health.

Vanuatu's Principal Veterinary Officer agreed, saying animal health is the poor cousin, despite its close relationship to food security and livelihoods. A One Health approach has tangible benefits –diseases such as leptospirosis require more interest for progress to be made.

French Polynesia said animal husbandry techniques are a limiting factor for animal health. More focus on AMR will be useful as French Polynesia wants to update its approach to the issue.

Cook Islands agreed that husbandry is important and said certification is required to administer drugs to animals. Cook Islands has a lack of animal disease thanks to support from New Zealand Biosecurity. Fiji noted there were many funding opportunities, though funding mechanisms can be time consuming to navigate. Implementation of projects through CSOs has many advantages.

SPC said an emphasis on animal welfare (One Welfare) required a change in farmers' mindset, e.g. through field schools. Project approaches based on animal welfare can contribute to One Health. SPC has an MOU with OIE but only five PICTs are OIE members.

## **6. Way forward**

Participants discussed and agreed on the meeting's conclusions and decision points, noting these would be circulated for their review.

## **7. Closing remarks**

Dr Paula Vivili (Director of SPC's Public Health Division) thanked participants for their input and acknowledged the support of partners, especially AFD for its contribution to holding the meeting. He said One Health is a difficult topic, but the meeting had provided guidance on the way forward. He reminded countries they were welcome to provide further input to SPC on the issues raised.

## **Conclusions and Decision Points**

The meeting agreed that One Health is a complex undertaking and emphasised that activities must be linked to tangible outcomes for human, animal and environmental health.

The meeting acknowledged the existing collaboration that is in place for human health. However further support is required to identify opportunities for greater collaboration between human and animal health and inclusion of environmental and ecological factors.

Animal welfare/One Health and improved husbandry were identified as priorities by the animal health sector, while prevention and control of disease were priorities for the human health sector.

### **1. The meeting agreed on the following weightings for prioritisation of zoonotic diseases:**

Severity of illness in humans – 5  
Ability to prevent or control the disease in country – 4  
Economic burden of disease – 3  
Capacity to collaborate – 2  
Disease trend in last 5 years – 1

### **2. The meeting agreed that the next steps are for countries to:**

- i. complete their list of national priorities for zoonotic diseases;
- ii. continue to identify their research priorities across the human, animal and environmental health sectors;
- iii. define a mechanism to coordinate One Health strategies;
- iv. define a mechanism to coordinate One Health research interventions, initiatives and funding;
- v. identify capacity building needs in relation to One Health (e.g. national and regional expertise in entomology).

### **3. The meeting agreed on the need to:**

- i. strengthen partnerships between the human, animal and environmental health sectors in research;
- ii. empower local education institutions to provide One Health research and training leadership appropriate to the Pacific context;
- iii. address vector control from environmental health perspectives, including through better water management and environmental hygiene, noting the contribution of planning of natural and built infrastructure.

**4. The meeting acknowledged the indication from partners that:**

- i. country priorities from the meeting will flow into planning processes to support One Health related activities;
- ii. countries must be aware of, provide guidance to, and take advantage of the support offered by partners.

## ANNEX 1: Agenda

Time	Topics	Speakers/Facilitators
8.00 - 8.30am	Registration	Béryll Fulilagi/ Elise Benyon
8.30 - 9.00am	<b>Opening session</b> <ul style="list-style-type: none"> <li>Opening prayer</li> <li>Welcome remarks</li> <li>Opening address by chief guest</li> </ul>	Moderator: Dr Salanieta T Saketa  Dr Audrey Aumua, DDG Suva Hon. Mr Alexander O'Connor, Assistant Minister of Health and Medical Services, Fiji
9.00 - 9.45am	<b>Introduction</b> <ul style="list-style-type: none"> <li>Introduction of participants</li> <li>Introduction to the meeting/Lessons learnt in One Health approach –SPC experience with PRIPP</li> </ul>	Moderator: Ms Salanieta Duituturaga All Dr Salanieta T Saketa, Human health perspective Dr Ilagi Puana, Animal health perspective
9.45 - 10.00am	<b>Scene Setting</b> <ul style="list-style-type: none"> <li>Pacific health security, One Health and lessons learnt from Ebola, MERS and other emerging infectious diseases</li> <li>Eco-Health and One Health</li> <li>One Health Approach in addressing Zoonotic diseases (leptospirosis) and lessons learnt- Fiji experience</li> </ul>	Moderators: Ms Salanieta Duituturaga/Dr Simon Reid  Dr Angela Merianos, WHO
10.00 - 10.15am		Dr Aaron Jenkins, University of Sydney
10.15 - 10.30am		Dr Eric Rafai, Fiji Ministry of Health and Medical Services Dr Simon Reid, University of Queensland
10.30 - 11.00am	Tea break and group photo	
11.00 - 11.45am	<b>Scene setting (cont.)</b> <ul style="list-style-type: none"> <li>Plenary discussion</li> </ul>	Moderator: Dr Simon Reid
11.45 - 12.30pm	<b>Workshop 1</b> <ul style="list-style-type: none"> <li>Prioritising zoonosis of national concern</li> </ul>	Facilitators: Angela Merianos / Jojo Merilles
12.30 - 1.30pm	Lunch	
1.30 – 2.15pm	<b>Workshops 2 and 3</b> <ul style="list-style-type: none"> <li>Identification of research priorities</li> <li>Identification of vector control capacities</li> </ul>	Facilitators: Aaron Jenkins / Morgan Mangeas Simon Reid / Cyrille Goarant
2.15 – 3.15pm	<b>Plenary presentation and discussion</b> <ul style="list-style-type: none"> <li>Workshop 1 output</li> <li>Workshop 2 output</li> <li>Workshop 3 output</li> </ul>	Moderator: Dr Simon Reid Presenter 1 Presenter 2 Presenter 3
3.15 – 3.30pm	Tea break	
3.30 – 4.30pm	<b>Workshop 4</b> Planned activities for 2018-2020	Facilitators: Simon Reid, Aaron Jenkins, Ilagi Puana
4.30 – 4.50pm	<ul style="list-style-type: none"> <li>Way forward</li> </ul>	Moderators : Angela Merianos / Salanieta Saketa
4.50 – 5.00pm	Closing remarks	Salanieta Saketa

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## Response to consultation on Australian Government Voluntary National Review Process for SDG Implementation

### ACFID Member Case Study: Planetary Health

#### **Finding a nexus approach to sustainable development goals, planetary health and typhoid fever: managing river basins and water-related diseases in Fiji.**

[Dr Aaron P. Jenkins](#), Research Fellow in Planetary Health\*

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Most of us working in international development recognize or have engaged with the post-2015 global development agenda, which is founded in an ambitious, complex and interconnected set of 17 Sustainable Development Goals (SDGs). For all practical purposes, these global goals are prominent in the discourse and practice of country level activities designed to manage environments, human health and wellbeing. SDGs have been critiqued for aspirational idealism and lack of critical political analysis, and lauded for presenting a compelling vision of what the world should look like, emerging from a socially inclusive process (Labonté 2016). What the SDGs have achieved well is clearly highlight that human health and environmental sustainability cannot be addressed by individual sectors, and that a “nexus” approach must be sought that integrates goals across sectors and disciplines. Human health, understandably, occupies a central position in the SDG agenda as a target that reflects progress in most other goals. On the whole, health targets can be reliably measured using well-developed scientific methods, the impact of specific interventions can be assessed, and changes over time can be tracked (WHO 2016).

Embedded within the SDG vision is the concept of Planetary Health (Whitmee et al. 2015), launched by the academic community about the same time as the SDGs were approved in 2015, and recently discussed in the UN General Assembly as a plausible framework for achieving SDG implementation. Planetary Health, put simply, is *the health of human civilisation and the natural systems on which it depends*. Inherent in achieving the SDGs and enacting such a concept is a belief that divorcing economic growth from ecological impact is possible. This can be difficult to reconcile, however, particularly when processes driving their enactment are entrenched in the same systems of governance and industrial growth that contribute to poverty, inequality and ecological transformation. Given this difficulty, there is a vital need to develop research and practice that seeks to understand the range of positive and negative interactions among SDGs to ensure that apparent progress made in some areas is not made at the expense of lack of progress in others, and that can reliably inform cross-sectoral decision-making. This means seeking interventions supporting policy coherence and considering co-benefits in planning and financing decisions. Ultimately, this will require a fundamental shift in mindset, from one of competition to one that emphasises cooperation and collaboration.

In Fiji, like many Pacific Islands, outbreaks of several water-related diseases (e.g. typhoid, leptospirosis, and dengue) are common and result in repeated, costly and poorly co-ordinated response measures (Jenkins and Jupiter 2015). By 2015, the Pacific Islands had fallen behind both Asia and sub-Saharan Africa to become the

region with the least access to improved drinking water (WHO-UNICEF 2015). Recurring cyclones and flooding events raise the risk of climate-sensitive and water-related diseases and these health threats are amplified by high levels of dependence on natural resources for subsistence and concentrated populations along low-lying floodplains and coastal margins (Jenkins and Jupiter 2015). Like many important global issues, typhoid fever is crucially intertwined with inequality and the environment. It is inextricably tied to malnutrition, poor health, poor education and lack of access to clean water and sanitation, many of the key factors that the SDGs target. I will offer a brief reflection, from my research experiences working on both river basin management and typhoid fever prevention and control in Fiji, on how a “nexus” approach to combating this disease (or any water related illness) can be a straightforward, practical and cost-effective way to make progress on many of the SDGs in a way that aligns with the priorities of most sectors.

In a set of studies from Fiji, my colleagues and I demonstrated the notable absence from degraded river basins of suites of fishes that traditionally formed the staple diets of inland communities (Jenkins et al. 2010). These effects are largely seasonal and magnified in degraded catchments, with pronounced negative impacts on food-provisioning services and biodiversity during heavy rainfall and severe storms (Jenkins & Jupiter 2011). For many Fijian inland communities, freshwater fishes not only comprise a major part of their diet but also have important cultural totemic values. The loss of freshwater fish biodiversity, therefore, has important implications for both physical and cultural wellbeing. Our recent research in Fiji has also documented how many of these same river basin scale anthropogenic alterations of land cover and hydrology that are causing aquatic biodiversity loss – particularly deforestation and fragmentation of riparian forest and connections between road and river networks – also facilitate the transmission of typhoid fever through processes of increased erosion and flooding (Jenkins et al. 2016). Additional research has documented similar environmental drivers of leptospirosis in Fiji, including high-density livestock farming near rivers and increased susceptibility to flooding (Lau et al. 2016). A very recent study added weight to this evidence, finding that higher upstream tree cover is associated with lower probability of diarrheal diseases downstream in 35 developing countries (Herrera et al 2017).

Even though poor river basin management has been demonstrated to compromise bio-cultural diversity and food and water security, the response by public health, conservation and humanitarian agencies has been piecemeal and reactive. Little attention is being given either to basin-scale preventative measures or attempts to evaluate the compounded downstream impacts on ecosystem services such as disease regulation, food provision or psychosocial impacts. Instead, the focus has largely been one-dimensional, end-of-the-line strategies such as post-outbreak vaccination, post flood river dredging, or post-collapse fisheries closures – further underscoring the missed opportunity for addressing up-stream risk factors and achieving multiple dividends. Managing small island river basins to ensure the protection of ecosystem services provided by limited freshwater resources, and their highly threatened aquatic biodiversity, is a critical sustainable development challenge and a major “nexus” point in which to examine the relationships between multiple SDGs related to environmental condition, biodiversity and public health and wellbeing.

We must demonstrate leadership by developing interventions that take a holistic perspective to ensure that progress in some areas supports progress overall. As we reflect on this research and discuss a way forward, think about planetary health as a “nexus” approach that integrates goals across sectors and disciplines, makes achieving the SDGs more cost-effective and efficient, reduces the risk that some SDG actions will undermine one another, and ensures sustainable resource use is necessary. As sectors affect each other, resources are limited, and time is running out, this “nexus” approach will help us achieve more than one SDG at the same time at a faster rate and on a larger scale.

## Planetary Health Initiative

The University of Sydney has appointed the first professor of Planetary Health worldwide – [Professor Anthony Capon](#) – and we are already working with philanthropic groups including the Wellcome Trust, Rockefeller, the UNDP and NSW government. We are also hosts of the Human Health and Social Impacts Node for NSW Government and Prof Capon recently spoke at a side event during General Assembly moderated by Achim Steiner.

The University of Sydney is committed to advancing planetary health by:



- developing multidisciplinary research on the relationships between human health and natural systems, the drivers of ecological change, and their broader sociocultural context;
- offering undergraduate and postgraduate teaching that will equip graduates with the skills and attributes to help find solutions to planetary health challenges; and
- providing leadership and engagement with policy, industry and communities on questions related to planetary health.

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## Input into DFAT consultations on a Pacific Islands Forum 2050 Strategy

*Manfred Lenzen, ISA, School of Physics, 9 November 2020*

- **What are the major challenges facing our region as we work together to achieve the vision for a Blue Pacific Continent by 2050?**

Pacific Island nations face a range of challenges, such as

- i) Climate change, especially sea level rise and cyclone frequency
- ii) High energy prices
- iii) High prices of imports, especially food
- iv) Shortage of waste disposal options
- v) Obesity
- vi) Shortage of fresh water
- vii) Small domestic base of skilled labour
- viii) Limited export opportunities
- ix) Fisheries management, especially harmful algal blooms and ciguatera incidence

- **How might these challenges impact on our region over the next 30 years to 2050?**

These challenges might impact on Pacific Island nations as follows:

- i) Loss of property and productive assets
- ii) Loss of energy security
- iii) Loss of food security, and budget deficits
- iv) Ocean and land pollution from unsafe waste disposal practices
- v) Public health cost increases
- vi) Loss of water security
- vii) Dependence on overseas knowledge and skills
- viii) Untapped revenue and trade
- ix) Loss of domestic food and revenue source

- **How might COVID-19 impact on our region's development trajectory to 2050?**

The Coronavirus pandemic will compound and exacerbate some of these challenges, such as iii) budget deficits, v) Public health cost increases, and viii) loss of revenue.

- **How can Pacific Islands Forum members work together to address these challenges, including through closer economic and security linkages that preserve national sovereignty?**

Working together offers a clear benefit to Pacific Island nations, primarily through enhancing the skill base, when small nations can draw on each other's indigenous island-friendly skills and knowledge.

An example for this is the *Sustainable Islands Program* that was conducted at the University of Sydney from 2007 to 2016, funded by DFAT's Australia Awards. Within this Program, community leaders from Pacific Island nations were brought together to exchange experience, learn new skills, and build new networks aimed at

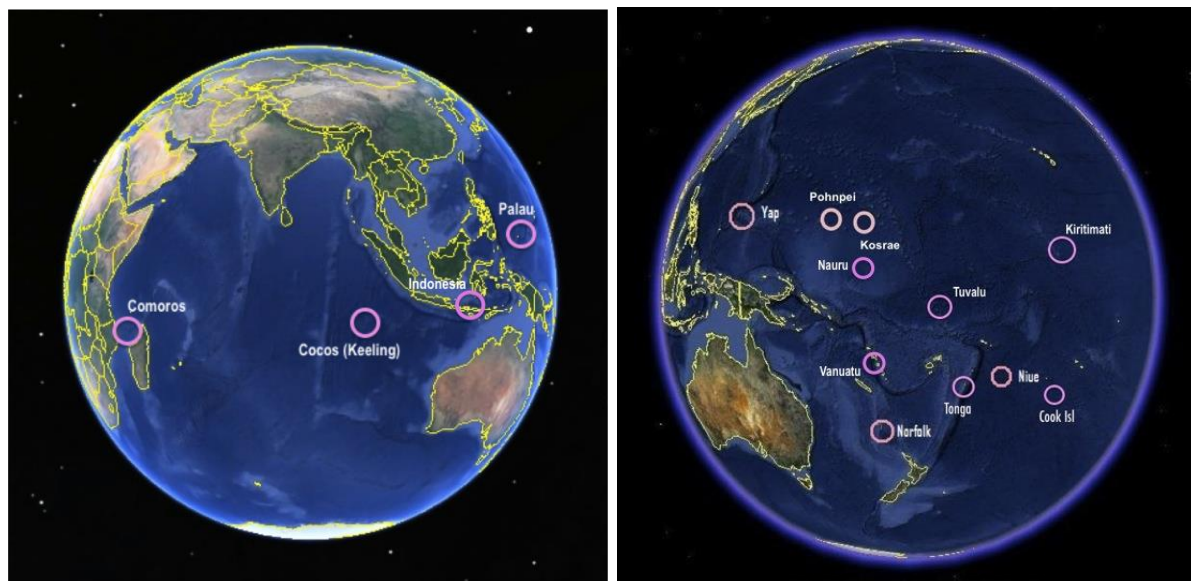
- Understanding the **energy** metabolism of their islands, and identifying key leverage points for energy and financial savings; training in **accounting** for sustainability.
- Understanding the **fisheries** resources of their islands, and identifying key strategies for managing fisheries reserves and creating new export markets.
- Field trip to Norfolk Island, in collaboration with EcoNorfolk and EcoNauru NGOs: Understanding how leadership and initiative can create sustainable, island-friendly solutions for **local employment and entrepreneurship**. Site visits addressing electric power supply, greenhouse gas mitigation, local manufacturing, circular-economy solutions for **waste disposal**.

Unfortunately, the funding for Australia Awards Fellowships and the Endeavour Program were discontinued, and there exists currently no realistic DFAT-funded option for Pacific applicants to undertake specialist or leadership training in Australia.

- **Expertise at the University of Sydney**

There exists expertise on Pacific Islands sustainability within the ISA group at the School of Physics, which is reflected in a number of publications, partly co-authored with island leaders: Lenzen 2008; Lenzen *et al.* 2013; Malik 2016; Tyedmers *et al.* 2020; Yousefzadeh *et al.* 2020. Published work deals with issues in Norfolk Island, Federated States of Micronesia, Niue, Cocos (Keeling) Islands, Cook Islands and Nauru. Work on Tonga, Vanuatu, New Caledonia and Kiribati is currently underway.

The ISA group enjoys a large collaborator network across the Pacific (see map below).



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# **Submission to the Pacific Islands Forum on The 2050 Strategy for the Blue Pacific Continent**

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**16 November 2020**

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## Executive Summary

The prospect of a prosperous and transformative Blue Pacific Continent by 2050 will hang in the balance if the prevention and control of non-communicable diseases (NCDs) is excluded from being a core part of the Strategy.

The prevalence of NCDs has been increasing steadily in the Pacific for decades and has now reached crisis level with the epidemic accounting for at least 75% of all deaths in the region.

The World Health Organization (WHO) has developed 'best buys' in NCD prevention – a set of 16 practical and cost-effective interventions that work and can be delivered at the primary level, and in a range of country context. The best buys are a powerful economic tool. WHO has estimated that every dollar invested in the best buys will yield a return of at least seven dollars.

Pacific Island countries also need to go beyond the health sector to address the root causes of NCDs, in the food we eat, the water we drink, the air we breathe and the conditions in which people live, work and play. A *Whole-of-government* and *Whole-of-Pacific approach* is essential. The recent WHO report on progress and capacity for NCD prevention and control in the Western Pacific makes important recommendations for the way forward:

- Development of coherent policies across government sectors through a Health-in-All Policies approach to address NCDs is recommended. Dialogues with lawmakers and with sectors beyond health and non-state actors are crucial to the development, implementation and enforcement of legislations and regulations related to NCDs and their risk factors;
- Prioritising and accelerating the implementation (according to national context) of the most cost-effective, affordable and evidence-based interventions that address the NCD risk factors. Increased financing is also critical in the implementation of these interventions and is an urgent issue which governments should address; and
- Provision of essential population-level, people-centred public health functions, including that for the prevention and management of NCDs, is fundamental to achieving universal health coverage. Strengthening the surveillance and monitoring systems in countries is also crucial as they enable the reporting of progress against the global targets for NCDs.

The strategic opportunities that can result in a 'win-win' for a Blue Pacific Continent by 2050 include:

- Maintaining and strengthening whole-of-Pacific NCD surveillance systems and strategies to monitor and evaluate progress;
- Establishing a regional knowledge hub to boost capacity to deliver and implement on the ground efforts and share regional understanding of how to tackle the NCD risk factors, low physical activity, tobacco use, poor nutrition, and harmful alcohol consumption - the Pacific Way; and
- Implementing intraregional trade and whole-of-Pacific fiscal measures to increase access, availability and promote healthier food consumption.

## **The importance of addressing Non-Communicable Diseases (NCDs) within the 2050 Strategy**

The prospect of a prosperous Blue Pacific Continent by 2050 will hang in the balance if the prevention and control of non-communicable diseases (NCDs) is excluded from the Strategy.

NCDs, also known as chronic diseases, are not passed from person to person. They are of long duration, slow progression and generally require ongoing medical attention. The four main types – cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases – impose a major and growing burden on health and development (WHO 2020a).

The Pacific region had documented extreme chronic disease rates, particularly diabetes and cardiovascular diseases, and related risk factors well before these problems were taken seriously as a global public health ‘crisis’ (Zimmet et al 1984; Taylor & Thoma 1985; Yach et al 2006; Daar et al 2007). The NCD Pacific crisis has been increasing steadily for decades, accounting for 75% of all deaths in the region (WHO 2018), and in some countries the rate is higher. While life expectancy is increasing in other developing countries, this has fallen in several Pacific Island countries as a result of premature mortality from NCDs (deaths before 60 years of age). Much of this avoidable burden is linked to high rates of diabetes and obesity in the Pacific. Globally, seven of the top ten countries for diabetes prevalence are Pacific Island countries with comparative prevalence rates of 19-31% of the population. The cost of NCDs to the Pacific economies, health systems, individuals and families, therefore, is high and unsustainable (Anderson 2013).

**NCDs are a crucial development issue.** The social and economic costs of NCDs impose significant burden on sustainable development and health securities. There are concerted international and political commitments on NCDs, and at the Third United Nations High-level Meeting on NCDs in 2018, the General Assembly declared that countries:

“Develop, as appropriate, a national investment case on the prevention and control of non-communicable diseases to raise awareness about the national public health burden caused by non-communicable diseases, health inequities, the relationship between non-communicable diseases, poverty and social and economic development, the number of lives that could be saved and the return on investment”

These NCDs share modifiable behavioural risk factors such as tobacco use, unhealthy diets, physical inactivity and harmful use of alcohol, which lead to four metabolic/physiologic changes – raised blood pressure, overweight and obesity, raised blood glucose, and raised cholesterol (Table 1) (WHO 2018).

The Pacific Island countries have some of the highest rates of risk factors in the world. As summarised in Appendix 1 (Kessaram et al 2015), surveillance data from countries for which data are available over the last two decades show daily smoking rates ranging from 25% in Niue to 75% in Kiribati among males aged 25-64 years; this is compared to 13% among



males aged 18 years and older in Australia (AIHW 2020). Over 70% of adults in the Cook Islands are physically inactive, compared to 55% of Australian adults. In seven countries more than 60% of adults are overweight or obese, compared to 67% of Australian adults in 2017-2018. These risk factors set a disturbing scenario for future NCDs in the Pacific.

		Modifiable common risk factors for NCDs			
		Tobacco use	Unhealthy diets	Physical inactivity	Harmful use of alcohol
Noncommunicable diseases	Heart disease and stroke	✓	✓	✓	✓
	Diabetes	✓	✓	✓	✓
	Cancer	✓	✓	✓	✓
	Chronic lung disease	✓			

Table 1: Four non-communicable diseases, four shared risk factors. Source: WHO

**Ongoing vulnerabilities to environmental and climate change will compound and accelerate some of these NCD risk factors and diseases in the Pacific.** In their review of the relationships between climate change, NCDs and development (Friel et al 2011), the authors concluded that:

“Climate change will exacerbate levels of cardiovascular and respiratory diseases, poor mental health, injuries, and malnutrition... (and that) Reductions in both CVD and some cancers would arise from a reduction in the production and consumption of animal-source products among high-consuming populations.”

Similar conclusions have been put forward in *The Diabetes and Climate Change Report* published by the International Diabetes Federation (IDF 2012), written by global experts from the environmental and health sectors, presented evidence that diabetes and climate change exacerbate and directly impact upon each other. That climate change in the form of extreme heat and hotter daily temperatures will exacerbate physical inactivity and sedentary behaviours. That unhealthy diets will become more prominent as a result of climate change disrupting traditional food supplies, forcing an increasing reliance on processed imported foods that are of poor nutritional value.

With the existing high level of risk factors for NCDs, combined with the growing threat of climate change to worsening health conditions and lowering living standards in the Pacific, ignoring NCDs is not be an option. For the afore-mentioned reasons, the prevention and control of NCDs must be a key part of the 2050 Strategy for the Blue Pacific Continent.

## There are effective and scalable solutions that can have significant development and financial returns for the 2050 Blue Pacific Continent

WHO has developed ‘best buys’ – a set of 16 practical and cost effective interventions that work and can be delivered at the primary level, and in a range of country context. These best buys and priority policy options are endorsed in the *Pacific NCD Roadmap* (World Bank 2014) and adopted by Joint Forum Economic and Pacific Health Ministers. These best buy solutions put the emphasis on promoting health and preventing disease through public health actions like increasing tobacco taxes; restricting alcohol and junk food advertising; reformulating food products with less salt, sugar and fat; vaccinating girls against cervical cancer; treating hypertension and diabetes; and more. Collectively, these measures will reduce premature mortality from NCDs.

The best buys are a powerful economic tool. WHO has estimated that every dollar invested in the best buys will yield a return of at least seven dollars (if implemented globally, they will save 10 million lives by 2025, and prevent 17 million strokes and heart attacks by 2030). In addition to strong primary health care, Pacific Island countries also need to go beyond the health sector to address the root causes of NCDs, in the food we eat, the water we drink, the air we breathe and the conditions in which people live, work and play.

A ***Whole-of-government and Whole-of-Pacific approach*** is essential (WHO 2020b). A WHO report on progress and capacity for NCD prevention and control in the Western Pacific makes important recommendations for the way forward (WHO 2017):

- i. Development of coherent policies across government sectors through a ***Health-in-All Policies (HiAP) approach*** to address NCDs is recommended. (See Appendix 2 for an example of an HiAP approach). Dialogues with lawmakers and with sectors beyond health and non-state actors are crucial to the development, implementation and enforcement of legislations and regulations related to NCDs and their risk factors;
- ii. Prioritising and ***accelerating the implementation (according to national context) of the most cost-effective, affordable and evidence-based interventions that address the NCD risk factors***. Increased financing is also critical in the implementation of these interventions and is an urgent issue which governments should address;
- iii. Provision of essential population-level, people-centred public health functions, including that for the prevention and management of NCDs, is fundamental to achieving universal health coverage. Strengthening the surveillance and monitoring systems in countries is also crucial as they enable the reporting of progress against the global targets for NCDs.

## **There are several strategic opportunities that can result in a ‘win-win’ for a Blue Pacific Continent by 2050**

### Building on past successes in health information and NCD surveillance and monitoring

A key area where Australia could work together with Pacific Islands Forum members and regional health agencies to address the NCD and economic challenges is to build on and strengthen the population health surveillance and monitoring systems across the Pacific. Robust and sustained surveillance systems capable of collecting nationally representative data can effectively track epidemiological changes, allowing Pacific governments to determine program and policy priorities and implementation. Sustained funding of ongoing and repeat data collection within and across the Pacific region will be crucial so that important trends data can continue to be collected; this also provides an efficient way for evaluating the impact of key public health actions and national NCD prevention and control efforts. This should also allow members to strengthen and sustain their reporting efforts as part of the Pacific Monitoring Alliance for NCD Action (MANA) dashboard (<https://www.pacificdata.org/dashboard/health-dashboard>).

Several routine data collection systems currently exist in many Island nations, although at different levels of capability. Given that limited national resources and workforce capacity are likely, country members should prioritise two surveillance systems which are essential if Pacific Islands are to achieve progress on NCDs in 2050: the WHO STEPwise Surveillance of NCD risk factors (STEPS) and; the Global School-based Student Health Survey (GSHS) (Table 2). Both surveillance systems collect data on risk factor levels and patterns in the population (tobacco use, alcohol use, physical activity, diet, salt intake, overweight/obesity, hypertension, diabetes, health care utilisation, screening behaviours). These systems have been used globally and are adaptive to low-middle resource contexts.

Regional leadership and multi-agency collaboration can assist small Island members with limited national resources to collect surveillance data. For example, setting up a regional and cross-agency team of NCD surveillance and monitoring experts to work across the region means that no Pacific Island Country is left behind, and that smaller Island countries are able to implement rigorous surveillance efforts in a sustainable manner.

In this area, the University of Sydney is well placed to work with regional leaders and country members in strengthening in-country data collection, analysis and reporting capability. A/Professor Phongsavan and colleagues have worked with WHO and countries in several STEPS surveillance and GHS or equivalent projects – summarised in Table 2 - across the Pacific region, specifically in Nauru (2004), Tonga (2004, 2012; GSHS), Fiji (2002), American Samoa (2004), Cook Islands (2004), Tokelau (2005), Kiribati (2006), Vanuatu (2001, GSHS), and Federated States of Micronesia (2002; GSHS).

There is a real danger that the wealth of information that had been collected by country members so far will not be maximised to inform ongoing NCDs monitoring and surveillance efforts. In light of this risk, a regional coordination and governance mechanism is necessary to facilitate collaboration and engagement between Island Forum members, WHO/UN

agencies, regional inter-governmental agencies and Australian universities. This coordination body can also enable greater access to and sharing of data across Pacific region.

Country	Years in which a STEPS survey was conducted	Year of Demographic Health Survey	Most recent GSHS
Cook Islands	2004 and 2014	–	2010
Fiji	2002 and 2011	–	2010
Kiribati	2004–06 (and 2015 near completion)	2009	2011
Nauru	2004	2007	2011
Niue	2011		2010
Samoa	2004 and 2013	2009	2011
Solomon Islands	2006 and 2015	2007	2011
Papua New Guinea	2007–08	1996 and 2006	2007
Tokelau	2005 and 2015	–	–
Tonga	2004 and 2012	2012	2010
Tuvalu	2007	2007	2013
Vanuatu	2011	2013	2011

Table 2 Pacific Island Countries data sources and availability. Source: Gouda et al 2015

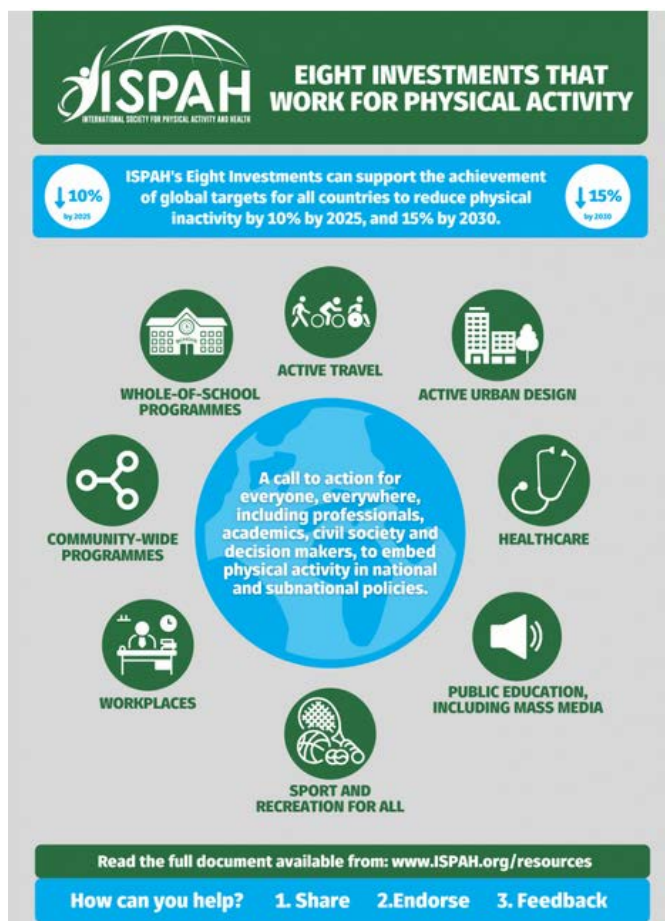
### Physical activity: a gateway to better health and social inclusion

Physical activity fosters community cohesion and social connections, enhances mental health, and improves physical functioning. The evidence is well established for the health-enhancing benefits of physical activity and its contribution to reducing the burden of NCDs. WHO recognises physical activity as a ‘best buy’ for the prevention and control of NCDs, setting global targets of a 15% reduction in the prevalence of physical inactivity in the next decade (WHO 2018). Despite being an important risk factor, recognised in a range of Pacific guidelines (WHO 2008; SPC 2018), and repeated commitments to tackle inactivity by the Pacific leaders over the years, it is surprising that the implementation of cost-effective programs has received sporadic attention in Pacific policy and governance structures.

The recently released (10<sup>th</sup> November 2020) *8 Investments That Work for Physical Activity* by the International Society for Physical Activity and Health ([www.ispah.org](http://www.ispah.org)), and coordinated by Dr Lindsey Reece, provides a summary of action areas which are supported by scientific evidence and have worldwide applicability. It is a “call to action for everyone, everywhere, including professionals, academics, civil society and decision makers, to embed physical activity in national and subnational policies”.

The *8 investments* can help Pacific Island Forum place physical activity on political agenda of members. Importantly, this is a call to action for all relevant sectors of government, every

agency in the Pacific, including professionals, academics, civil society and policy makers, to embed physical activity in national and regional policies.



Central to *8 Investments* is a systems-based approach. Recognising there is no single solution to increase physical activity, investments should not be expected to work in isolation; instead they should be combined to work together in a coherent and complementary way. The investments recognise that multiple stakeholders from diverse contexts, can and should be united to tackle physical inactivity. Such stakeholders may not previously have engaged in the physical activity agenda. Stakeholders can discover how their work contributes to physical activity promotion, but also how their agenda is influenced by physical activity.

Scope to do much more on intraregional trade and whole-of-Pacific fiscal measures to increase access, availability and promote healthier consumption

A recent analysis by University of Sydney researchers (A/Prof Thow and colleagues) and Pacific partners (Farrell et al 2020) stated that:

“The unfolding COVID-19 pandemic has exposed the vulnerability of the Pacific food system to externalities and has had far reaching impacts, despite the small number of COVID-19 cases recorded thus far. Measures adopted to mitigate risk from the pandemic have had severe impacts on tourism, remittances, and international trade, among other aspects of the political economy of the region, and are thus impacting on food systems, food security and livelihoods. Of particular concern will be the interplay between loss of incomes and the availability and affordability of local and imported foods.”

The same analysis concluded that the Pacific food security and system could be strengthened by increasing regional production of locally grown foods, while providing the

health benefits of consuming fresh produce. The authors also argued for intraregional trade which can bolster regional economy, as well decreasing reliance on imported, packaged and processed foods.

### Accelerate NCD prevention momentum through locally-designed solutions for whole-of-Pacific implementation

There is already a vast number of global frameworks, action plans, tools and evidence-based know-how of what works in the prevention and control of NCDs. We have also seen significant political commitments among Pacific leaders. But surprisingly, sustained and coordinated implementation of country-level policies and programs is still lacking in many parts of the Pacific. There is still much to learn about the translation of global evidence to local context – especially in local understanding of structural barriers and facilitators to implementing and delivering culturally-specific and effective NCD prevention programs and policies in the Pacific context. Fundamentally, a regional and collective approach is critical to help smaller island nations achieve Pacific-wide implementation of public health policy and programs for long-lasting change.

This submission calls for the establishment of a regional knowledge hub to strengthen whole-of-Pacific policy-implementation pathways, and for facilitating shared capacity, development and dissemination of culturally-appropriate tools and networks to support the translation of evidence into public health actions at country level. Enabling the dissemination and sharing of local experiences of what and how programs or policies are working on the ground can reinforce Pacific pride and be a catalyst for regional cooperation and sharing of resources.

Our work in the Kingdom of Tonga, for example, shows how evidence-based best practice model of local and regional engagement can work, resulting in effective delivery of low-cost but high-impact anti-tobacco campaigns (Sugden et al 2016). The Tonga experience shows that public education – tailored to local context and designed with cultural sensitivity - through mass (social) media campaigns can shift the community social norms and attitudes around second-hand smoking and policy measures (Table 3, Figures 1-2). This successful example was part of a collaborative work program between the University of Sydney (A/Prof Phongsavan, Prof Bellew, J MacKenzie) and TongaHealth tasked with raising awareness and mitigating the harmful effects of second-hand smoking or passive smoking identified as a priority in the 2015-2020 Tonga NCD prevention strategy plan (*Tonga Non-communicable Disease Strategy 2015-2020*).

This regional collaboration characterises key features of effective national responses to tobacco control: leadership and governance in the form of Tonga Health Promotion Foundation, collaborative regional partnerships to compensate for limited resources to develop and deliver (what would otherwise be costly) public health campaigns, adaptation of proven effective campaigns by local people who understand small island politics and local culture, and dedicated financing mechanism and political commitment by Tongan and Australian Governments.

**Table 1** Initial TV ads adapted in Tonga

Original advertisement	Tongan adaptation
<b><i>Sponge</i></b> (2007) Cancer Institute NSW (Australia) <a href="http://67.199.72.89/mmr/english/ad_sponge.html">http://67.199.72.89/mmr/english/ad_sponge.html</a>	<a href="https://vimeo.com/101585008">https://vimeo.com/101585008</a>
<b><i>Brain</i></b> (1997) Department of Health (Australia) <a href="http://67.199.72.89/mmr/english/ad_brain.html">http://67.199.72.89/mmr/english/ad_brain.html</a>	<a href="https://vimeo.com/92896299">https://vimeo.com/92896299</a>
<b><i>Lung</i></b> (1997) Department of Health (Australia) <a href="http://67.199.72.89/mmr/english/ad_lungy.html">http://67.199.72.89/mmr/english/ad_lungy.html</a>	<a href="https://vimeo.com/92906662">https://vimeo.com/92906662</a>
<b><i>Artery, female version</i></b> (1997) Department of Health (Australia) <a href="http://67.199.72.89/mmr/english/ad_artery.html">http://67.199.72.89/mmr/english/ad_artery.html</a>	<a href="https://vimeo.com/92896336">https://vimeo.com/92896336</a>
<b><i>Artery, male version</i></b> (1997) Department of Health (Australia) <a href="http://67.199.72.89/mmr/english/ad_artery.html">http://67.199.72.89/mmr/english/ad_artery.html</a>	<a href="https://vimeo.com/92896257">https://vimeo.com/92896257</a>
<b><i>Heart</i></b> (2003) California Department of Health Services (USA) <a href="http://67.199.72.89/mmr/english/ad_clinical.html">http://67.199.72.89/mmr/english/ad_clinical.html</a>	<a href="https://vimeo.com/101579518">https://vimeo.com/101579518</a>

Table 3 Source: Sugden et al 2016



**Figure 1** Foreign actors appearing in the original ads were replaced with Tongans.

Source: Sugden et al 2016





**Figure 2** Secondhand smoke ads focused on exposure to children in cars and homes.

Source: Sugden et al 2016

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# Appendix 1

## Noncommunicable diseases and risk factors in adult populations of several Pacific Islands: results from the WHO STEPwise approach to surveillance

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### Abstract

**Objective:** To provide an overview of the prevalence of noncommunicable diseases (NCDs) and their risk factors in several Pacific island countries and territories (PICTs), in accordance with global NCD targets.

**Methods:** For six risk factors, data for adults (aged 25–64 years) from published reports of the World Health Organization STEPwise approach to NCD surveillance, or methodologically similar surveys, were collated, age standardised and compared across fifteen PICTs.

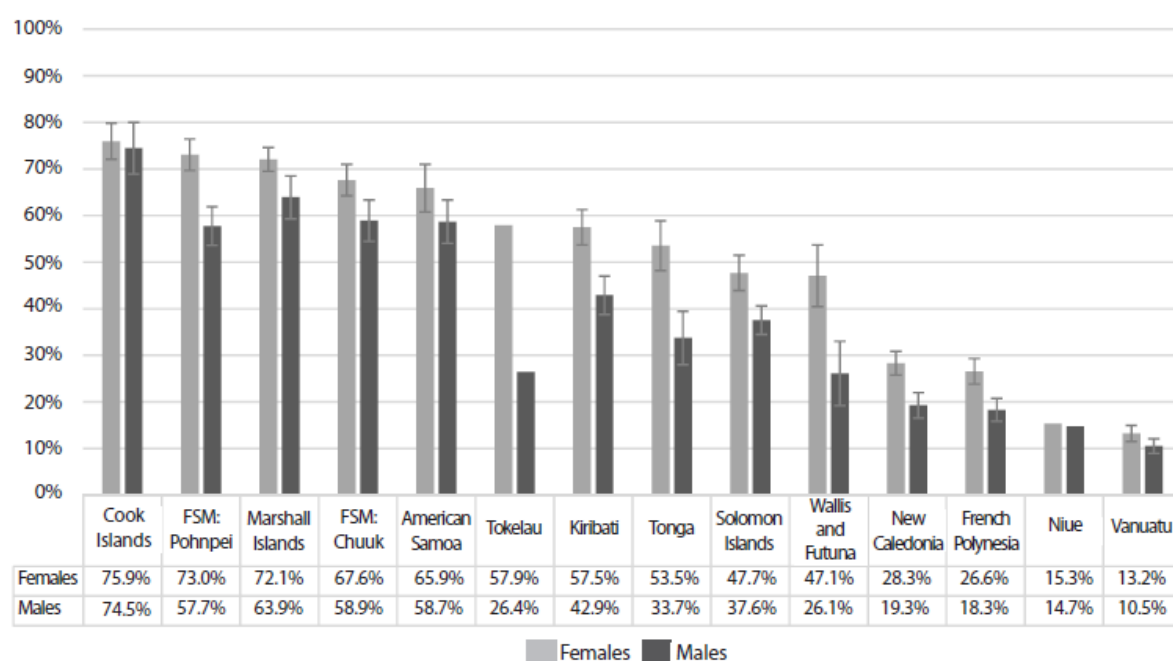
**Results:** In the majority of PICT populations, more than half of male current drinkers drank heavily and more than 40% of men and 20% of women were current smokers. In 10 populations, about 50% or more of women were insufficiently physically active. Prevalence of hypertension and diabetes exceeded 20% and 25%, respectively, in several populations. Near or more than half of men and women in all populations were overweight; in most, more than one-third of both sexes were obese.

**Conclusions:** The prevalence of NCDs and risk factors varies widely between PICTs and by sex. The evidence shows the high and alarming present and future burden of NCDs in the region.

**Implications:** Strengthened political commitment and increased investment are urgently required to tackle the NCD crisis, successfully achieve targets and ensure continuing sustainable development in the Pacific islands.

**Key words:** noncommunicable diseases, Pacific Islands, adults, prevalence, epidemiology

**Figure 2: Age-standardised prevalence (with 95% confidence intervals) of insufficient physical activity\* among those 25 to 64 years, by sex and Pacific Island Country and Territory.**



Source: STEPS and similar surveys conducted between 2002 and 2011.

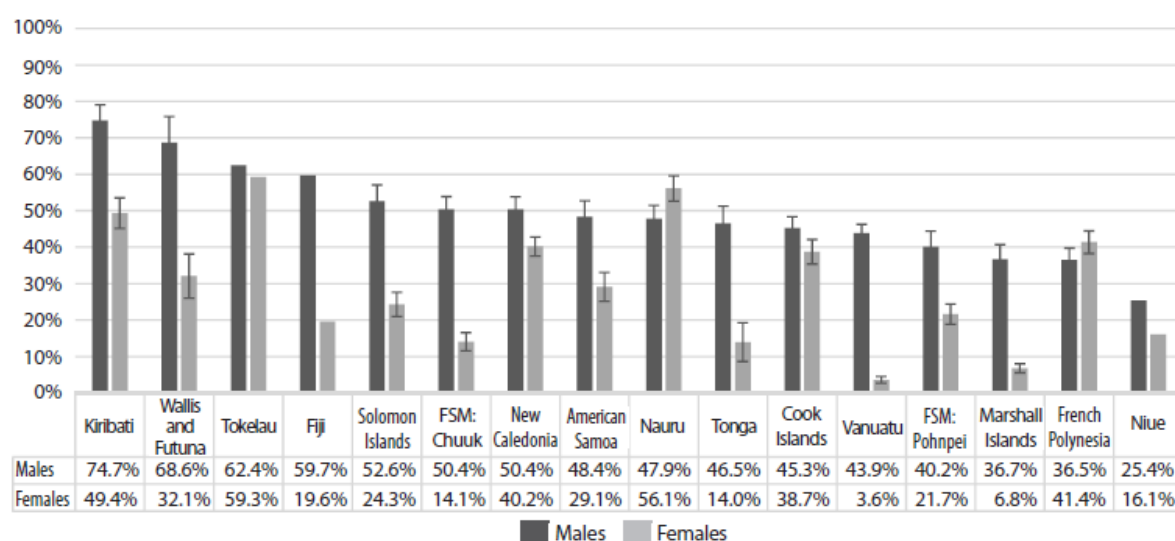
FSM: Federated States of Micronesia

\*Insufficient (or low) physical activity is <600 metabolic equivalent minutes per week. Physical activity is measured in STEPS according to the Global Physical Activity Questionnaire, in which a Metabolic Equivalent (MET) is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is the energy cost of sitting quietly, and equates to a caloric consumption of 1 kcal/kg/hour. Moderate activities are assigned 4.0 METs, vigorous activities are assigned 8.0 METs. MET minutes per week are calculated from the total physical activity across the domains of work, leisure, and transport related walking/cycling which is assigned 4.0 METs. Source: Global Physical Activity Questionnaire (GPAQ) Analysis Guide. Geneva, Switzerland: WHO.

In the American Samoa STEPS analysis, transport related activity was assigned 3.0METs. In the Wallis and Futuna report, moderate work and leisure activity were assigned 3.0-6.0METs, vigorous activity was assigned 6.0METs. In the Republic of the Marshall Islands report<sup>15</sup> low physical activity was recorded if the criteria for moderate activity were not met – one of the definitions of moderate activity was the sum total of days spent in moderate or vigorous intensity physical activity across the three domains  $\geq 5$  days AND total physical activity MET minutes per week  $\geq 600$ .

Confidence intervals were not applicable to Tokelau and Niue results as the surveys were designed to include all members of the target adult population.

**Figure 3: Age-standardised prevalence (with 95% confidence intervals) of current smokers\* among those aged 25-64 years, by sex and Pacific Island Country and Territory.**



Source: STEPS and similar surveys conducted between 2002 and 2011.

FSM: Federated States of Micronesia

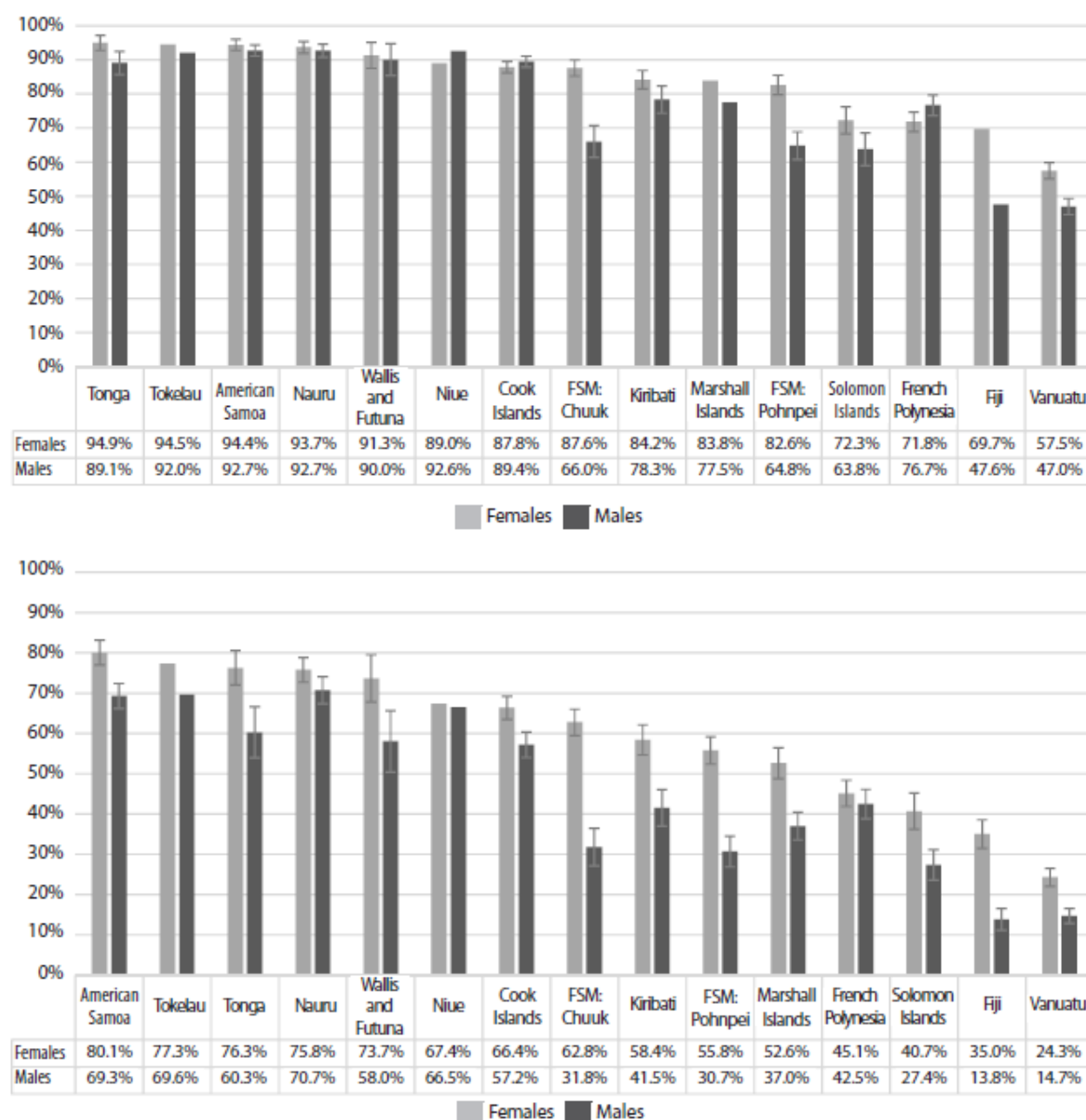
\*Current smoking was defined as smoking of tobacco (daily or non-daily) in the past 12 months, apart from in the French Polynesia, Nauru and New Caledonia reports in which the time frame was not specified.

The prevalence of current smoking in Fiji was estimated from the addition of the prevalence of daily and non-daily current (past 12 months) smokers as provided in the report. The corresponding 95% confidence intervals were not able to be calculated.

Due to a misprint in the reported age-specific rates of current smoking in women in the Tokelau report, we recalculated these using the case numbers provided and the age-specific sample numbers listed elsewhere in the report and verified by WHO.

Confidence intervals were not applicable to Tokelau and Niue results as the surveys were designed to include all members of the target population.

**Figure 6: Age-standardised prevalence (with 95% confidence intervals) of overweight (above) and obesity (below)\* among those 25 to 64 years, by sex and Pacific Island Country and Territory.**



Source: STEPS and similar surveys conducted between 2002 and 2011.

FSM: Federated States of Micronesia

\*Overweight was defined as body mass index (BMI)  $\geq 25\text{kg/m}^2$ , obesity was defined as BMI  $\geq 30\text{kg/m}^2$ .

The figure includes results only from surveys in which height and weight were measured directly. Comparable data from New Caledonia were not available.

Results for overweight for the Republic of the Marshall Islands and Fiji were estimated from the addition of the prevalence of BMI  $\geq 25$  and  $<30$ , and BMI  $\geq 30$ .

Corresponding 95% confidence intervals were not able to be calculated.

Confidence intervals were not applicable to Tokelau and Niue results as the surveys were designed to include all members of the target adult population.



## Developing antitobacco mass media campaign messages in a low-resource setting: experience from the Kingdom of Tonga

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### ABSTRACT

Tobacco use has become the leading cause of preventable death in Tonga, a small island nation in the South Pacific. One pragmatic and economical strategy to address this worrying trend is to adapt effective antitobacco mass media materials developed in high-income countries for local audiences. Using Tonga as an example, this paper shares the practical steps involved in adapting antitobacco campaign materials for local audiences with minimal resources, a limited budget and without the need for an external production team. The Tongan experience underscores the importance of an adaptation process that draws from evidence-based best-practice models and engages local and regional stakeholders to ensure that campaign materials are tailored to the local context and are embedded within a mix of antitobacco strategies.

materials developed in other countries and requesting permission to tailor this content to the local context by developing local translations of text, including images of local people and settings, and adding other locally specific content.<sup>9</sup> This allows for the development of evidence-based, high-quality materials that are appropriate to the local context. Against this backdrop, planning for Tongan adaptations of antitobacco advertisements produced in Australia, the UK and the USA started in mid-2014.

This paper presents some of the practical steps involved in adapting antitobacco campaign materials for local audiences with minimal resources, a limited budget and without the need for an external production team. It is argued that the adaptation approach can result in considerable savings of cost and time in low-resource and low-population

# Appendix 2

## An example of HIAP approach: physical activity

At the Twelfth Pacific Health Ministers Meeting in Rarotonga, Cook Islands in 2017, the Ministers summed up the NCD prevention and control efforts in the Pacific as follows:

“The ministers recognized the robust commitment over the last 10 years for the prevention and control of NCDs in Pacific island countries and territories, but realized that greater emphasis is needed on multisectoral approaches.”

Bellew and colleagues have discussed physical activity policy in the context of low and middle income countries including a description of tools cover planning, implementation, and evaluation of policies for physical activity in LMICs (Bellew et al in press). In each case, the suggested tool is free and accessible online. Some tools are generic (they usually translate to many country and regional contexts including LMICs), while others are more specific to the needs of LMICs (they take account of low-resource settings, the need to consider Sustainable Development Goals (SDGs) and the importance of Development Plans).

<b><i>LMIC relevant planning tools</i></b>		
<b>Name of tool</b>	<b>Description</b>	<b>Link</b>
WHO Toolkit for developing, implementing, and evaluating the National Multisectoral Action Plan (MAP) for NCD Prevention and Control	Specifies main steps, practical templates and examples in implementation and evaluation of public health action plans, including situation assessment, engagement of stakeholders, implementation, monitoring and evaluation.	<a href="#">Click here</a>
United Nations Development Programme (UNDP): Support to the implementation of the 2030 agenda for sustainable development	Explains the role of UNDP and describes the Mainstreaming, Acceleration and Policy Support (MAPS) framework for coherent and effective implementation support of the agenda for sustainable development, with special focus placed on the cross-cutting elements of data, partnerships and accountability.	<a href="#">Click here</a>
United Nations Development Programme (UNDP): National Development Planning/ Implementation: Strategy Note and Guide	A ‘pathfinder document’ that can be used when considering the integration of physical activity within national development planning. It is a part of a series of guides and tools developed to support partner organizations and countries that are developing new national responses or revisiting the existing ones. This example is HIV/AIDS focused, but it can be useful also in the context of physical activity.	<a href="#">Click here</a>

European Centre for Disease Prevention and Control (ECDC): Social media strategy development	Provides technical guidelines for using social media in public health communication. It can be useful when developing communication strategies in low-resource situations.	<a href="#">Click here</a>
<b><i>Generic planning tools</i></b>		
<b>Name of tool</b>	<b>Description</b>	<b>Link</b>
Tools to support a Health in All Policies (HiAP) approach	A guide for moving from theory to practice. Christchurch, New Zealand: Canterbury District Health Board.	<a href="#">Click here</a>
World Health Organization (WHO) Global Action Plan on Physical Activity GAPP	The key site for policy planners in the WHO Member States. It includes a comprehensive collection of tools and resources.	<a href="#">Click here</a>
Sport England	Useful tools, guides, and resources that can be used to facilitate promotion of physical activity, particularly among subgroups that are at highest risk of physical inactivity.	<a href="#">Click here</a>
Bridge Collaborative Global: Principles and Guidance for Cross-sector Action Planning and Evidence Evaluation	Provides several practical tools and resources that can be used to improve planning and evaluation of intersectoral policy actions.	<a href="#">Click here</a>
US CDC: Gateway to Health Communication and Social Marketing Practice	Includes guidelines, tools, and examples of best practices in social marketing and health communication.	<a href="#">Click here</a>
Trust for America's Health: A Compendium of Proven Community-Based Prevention Programs	Includes 79 evidence-based programs for disease and injury prevention from different countries, including programs for the promotion of physical activity which are described under the goals of reducing risk of diabetes, cardiovascular disease, stroke and falls.	<a href="#">Click here</a>
The Community Guide (PA): Community-Wide Campaigns	Sets out the findings of the US Community Preventive Services Task Force regarding community-wide campaigns to promote physical activity among children and adults.	<a href="#">Click here</a>
WHO Strategic Communications Framework for effective communications	Sets out tactics and principles that can be used to help develop communications that are more understandable, relevant, actionable, accessible and credible.	<a href="#">Click here</a>
Global Observatory for Physical Activity (GoPA!)	Includes standardised Country Cards with indicators relevant to national physical activity policy and sources to enable cross-country comparisons.	<a href="#">Click here</a>



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As an environmental engineer who looks at water and sanitation, I will speak to the challenges to achieve: *healthy and productive lives*.

What are the major challenges facing our region as we work together to achieve the vision for a Blue Pacific Continent by 2050?

The terrestrial and marine environments of the Pacific Islands are both diverse and highly vulnerable to climate change. The drive to ensure “*increased prosperity*” can not be at the expense of the environment. There is growing examples of policies that priorities profit over environmental sustainability. In Fiji [\*“The million dollar farmer”\*](#) initiative provides incentives to farmers to clear land to plant cash crops ( including rice, yams and watermelon). Frequently, the cash crops require large quantities of land, water, fertilizers and pesticides. The fixation on the profitability of the crops and promotion of farmers who make it to the million-dollar mark, further drives irreversible environmental degradation. The practice of mono-cropping further depletes soil health and leads to vulnerabilities to plant disease. [Taro leaf blight](#) is an on-going threat in the Pacific Islands and between 1993-94 the blight whipped out 100 % of the Samoan taro crop. Taro crops are the staple starch food for the Pacific Islands and it is threatened that taro leaf blight could result in wide spread food insecurity, akin to the last Irish potato famine. Soil quality in many Pacific Islands is somewhat fragile and increasing areas of rainforests are cleared every year in an attempt to find more fertile soil. This leads to losses of endangered native species, such as the endangered [Manumea](#), a tooth-billed pigeon found only in Samoa. Land clearing also disrupts local hydrological flows. Many rural communities rely on spring water and this disruption via deforestation and increased livestock numbers results in drinking water contamination and scarcity. A complexity with any land protection, is that large quantities of the Pacific Islands is privately owned land. This land is handed down from generation to generation. As families grow, there is more demand placed on that land for space for new houses, agricultural productivity and fishing resources. With large quantities of private land and strong drivers for economic productivity, it is very challenging to enforce conservation efforts.

The environmental degradation seen on-land is repeated in marine environments. Overfishing of undersize fish on inshore reefs leads to collapses in fish species. Coral reef health is significantly reduced by increased river loads of sediments and nutrients released by agricultural practices and land clearing up-stream. There are local efforts to protect marine environments (such as the endangered giant-clam in small marine sanctuaries in Tonga, Cook Islands, Fiji and Samoa), however, these sanctuaries are highly vulnerable and cannot consistently deter the demand for giant-clam meat and shell. Fish exportation is an important industry for many Pacific islands, nevertheless, off-shore fishing has seen dramatic drops in large pelagic species. The Pacific Islands have little ability to police or protect from overfishing. Many Pacific Islands rely on heavily on their marine environments as a source of protein and that resource is projected to collapse.

Climate change impacts in the Pacific Islands are most notably focused on rising sea-levels with immediate threats to low-lying atoll nations such as Kiribati and Tuvalu. There are other impacts of climate change which will be equally devastating: increased severity of cyclones, increased rainfall intensity and rising temperatures. Agricultural productivity will reduce, as increased rainfall intensity damages crops and washes away top soil into rivers. There will be increasing rates of human, plant and animal diseases as rising temperatures facilitate out-breaks of microbial pathogens. This is particularly true of drinking water-borne disease outbreaks, as it is known that increases in temperature facilitate growth of pathogenic species of bacteria, such as Cholera. These changes are already occurring and will accelerate more rapidly than Pacific Island communities will be able to adapt to.

How might these challenges impact on our region over the next 30 years to 2050?

The culmination of environmental degradation and climate change will be a Pacific Islands population that suffers from increased food insecurity and disease. This will lead to rising levels of poverty, climate refugees, inevitable conflict and fragility of nation-state security.

How might COVID-19 impact on our region's development trajectory to 2050?

International tourism is the life-blood of many Pacific Island nations. Sustainable tourism with a focus on eco-tourism (diving, rafting, trekking) is a viable and very valuable industry; one which makes environmental protection very profitable and justifiable. Tourism should be locally run and owned, as much as possible. There needs to be an active move away from the large tourist resorts, where large multinational hotels profit based on business models that exploit, such as Denarau Island in Fiji. COVID-19 and strict travel restrictions put in place by Australia and New Zealand have destroyed this industry. Once international travel is returned, there is a real risk that profit will be come at all costs and further result in the little environmental protections being eroded. There might also be an opportunity to actively shift tourism towards more sustainable eco-tourism practices.

How can Pacific Islands Forum members work together to address these challenges, including through closer economic and security linkages that preserve national sovereignty?

There needs to be strong policies that place environment at the centre of all economic policies. To achieve this, Pacific Island nations will need lines of credit to invest in the development of sustainable and green industries. There is a real risk, that the availability of finance will be severely limited post COVID-19. What money is available needs to be invested in environmental protection - the only viable mid-term insurance plan for the Pacific Islands.



# COVID-19 and Pacific food system resilience: opportunities to build a robust response

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## Abstract

The unfolding COVID-19 pandemic has exposed the vulnerability of the Pacific food system to externalities and has had far-reaching impacts, despite the small number of COVID-19 cases recorded thus far. Measures adopted to mitigate risk from the pandemic have had severe impacts on tourism, remittances, and international trade, among other aspects of the political economy of the region, and are thus impacting on food systems, food security and livelihoods. Of particular concern will be the interplay between loss of incomes and the availability and affordability of local and imported foods. In this paper, we examine some of the key pathways of impact on food systems, and identify opportunities to strengthen Pacific food systems during these challenging times. The great diversity among Pacific Island Countries and Territories in their economies, societies, and agricultural potential will be an important guide to planning interventions and developing scenarios of alternative futures. Bolstering regional production and intraregional trade in a currently import-dependent region could strengthen the regional economy, and provide the health benefits of consuming locally produced and harvested fresh foods – as well as decreasing reliance on global supply chains. However, significant production, processing, and storage challenges remain and would need to be consistently overcome to influence a move away from shelf-stable foods, particularly during periods when human movement is restricted and during post-disaster recovery.

**Keywords** Food security · Policy · Food systems · Pacific · COVID-19, pandemic

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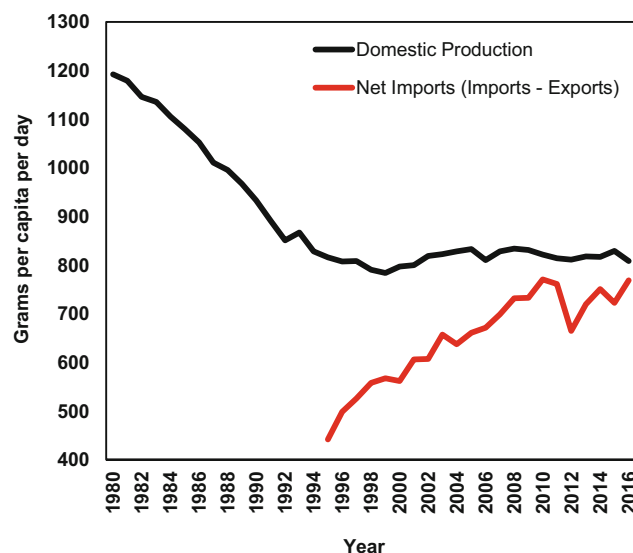
The unfolding COVID-19 pandemic is a crisis with many faces. It has exposed the vulnerability of the Pacific food system to externalities and has had far-reaching impacts, despite the small number of cases recorded thus far. In many respects, COVID-19 has ‘landed’ in the 21 countries and territories of the region, more as a suite of social, economic and food security issues than as a health crisis per se. Although the pandemic has yet to fully reveal itself as a health crisis in the region, it has prompted national governments and regional development partners to develop mitigation and adaptation measures at a scale not previously experienced in the region.

Pacific Island Countries and Territories (PICTs) are striving to ensure that COVID-19 does not evolve into a health crisis. The measures adopted to mitigate this risk – notably restrictions on the movement of people within and among countries – have had severe impacts on tourism, remittances, and international trade, among other aspects of the political economy of the region. PICTs are food import- and remittance-dependent economies (Connell 2013), and many are heavily reliant on income from tourism (e.g. Fiji, French Polynesia, New Caledonia, Palau, Samoa) (Wood 2020). The cessation of tourism is expected to result in substantial losses to economies – forecast scenarios in the range of US\$1–2 billion regionally (Pacific Community 2020). Such losses are realized across many parts of national economies, including unemployment, business failure, and changed patterns in the production and distribution of food. Reliance on remittances is also high: across 11 PICTs, funds transferred from overseas kin account for an average of 9.7% of GDP (Pacific Community 2020). Some countries have already experienced substantial falls in remittances since the COVID-19 outbreak (Graue 2020).

National food systems in the Pacific region share attributes with those in other Small Island Developing States (SIDS). Much of their fragility is due to geographic remoteness, growing import dependence, and in many places, limited arable land and declining agriculture production (Fig. 1). The region experienced a dramatic decline in per capita domestic crop production up to the mid-1990s, which has not been recovered.

Staple foods, particularly rice and wheat, account for much of the volume of food imported to the region, but nutrient dense and sugary food and beverages are also rising markedly. These trends in the availability of foods over the past half century (Thaman 1982) are reflected in diets which have shifted from being high in locally grown fresh fruits and vegetables, seeds and nuts, lean meat and seafood, to diets high in processed and often imported foods (Thow et al. 2011). Consequently, the triple burden of malnutrition<sup>1</sup> is a large and growing issue in the region (Global Nutrition Report 2018; Hughes and Lawrence 2005; Sievert et al. 2019) and

<sup>1</sup> The coexistence of undernutrition, overnutrition and micronutrient deficiencies.



**Fig. 1 Comparison of trends in food (crop) production and food trade, in grams, per capita per day.** Domestic production data includes crops, excluding cash crops. Trade data (net imports) includes foods relevant to food security, excluding cash crops; tuna was also excluded due to uncertainty in estimates. See Supplementary materials for Fig. 1 for the list of: a) foods included in the production and trade time series data and b) countries included in the presented annual mean production and trade estimates. Note, Fiji and Papua New Guinea were excluded due to their disproportionate influence on per capita estimates. Trade data derived from the Pacific Food Trade Database (Brewer et al. 2020). Crop production data downloaded from Food and Agriculture Organization of the United Nations (2020a). Population data sourced from Food and Agriculture Organization of the United Nations (2020b)

prevalence of diet-related non-communicable diseases are particularly high in PICTs (Anderson 2013).

These trends and events highlight the complexity of addressing the food security dimensions of the COVID-19 pandemic, in a landscape already challenged by processes and climate shocks that threaten economies and societies. In the last month, for example, Tropical Cyclone Harold swept through Solomon Islands, Vanuatu, Tonga, and Fiji in the midst of COVID-19 mitigation preparations, destroying houses and crops. The confluence of the cyclone and COVID-19 led to a tragic loss of life in the sea off the island of Malaita in Solomon Islands, as people travelled to their home villages from the capital (Kaukui 2020).

Even in the much-desired scenario that the region remains largely free of widespread infection, its impacts will manifest in many different ways (Table 1). The range of potential and actual impacts for food systems and food security in the Pacific region shown in Table 1 may be seen as a subset of those noted globally (Haddad et al. 2020a, b). Of particular concern will be the interplay between loss of incomes and the availability and affordability of local and imported foods. A disproportionate burden may fall on women and children as local availability and affordability of food is impacted through the closure of informal markets (Table 1). In Solomon Islands,

**Table 1** Summary of key potential food system impacts in the Pacific region

	Global analysis of potential COVID-19 related impacts on food systems	Pacific-specific food system context	Potential food system, food security and nutrition impacts in Pacific
Production	Access to inputs may be limited by restrictions on travel, reducing agricultural production, yields and income; access to services may be reduced (e.g. veterinary, extension services). Decreased demand and purchasing power will reduce investment and technology, further reducing availability. Seasonal impact needs to be considered.	Existing challenges in access to inputs, services, labour and finance; relatively long production cycles for root crops; data gaps in domestic production potential.	Increased demand for locally grown staples (e.g. root crops) if prices of imported commodities rise. Potential for increased participation in home gardening/own account production; even if production increases still variability in capacity, especially by geography and access to technologies; challenges to access inputs, services, labour and finance exacerbated.
	Little global commentary on fisheries to date.	Fish are the dominant animal-source food; <i>Beche de mer</i> is an important source of income for many rural communities.	Demand and domestic catch of fish may increase; probable major disruptions to regionally important tuna industry will impact on national access to tuna and economies.
	Restrictions on movement of people impacts seasonal agricultural workforce especially relevant for labour-intensive crops, such as fruits and vegetables. Higher vulnerability to COVID-19 for elderly farmers. Decreased ability for companies to care for workers health and wellbeing (across global supply chain).	Many Pacific Island Countries and Territories (PICTs) are remittance-dependent; seasonal agricultural labour to Australia and New Zealand is significant.	Reduction in labour force mobility may contribute to declines in income, which can have direct implications for people's access to food; disease and limited health services will impair agricultural output in the instance of high disease rates. Population flows from urban to rural areas, e.g. people returning to home villages, may influence availability of local rural labour for agriculture.
	Increased levels of post-harvest losses due to reduced workforce.	Regionally produced foods subject to high losses.	Existing post-harvest losses potentially exacerbated due to supply chain disruptions; potential for investment in primary processing, local distribution.
Processing	Food companies (domestic and external) facing increased demand for processed staples may experience input shortages due to production and transport being affected. Small and Medium Enterprises (SMEs) at risk of bankruptcy.	Limited domestic processing in PICTs and high dependence on imported inputs; village processing important for short distance/domestic distribution.	Reduced availability / increased prices for domestically produced staples and food that is usually processed in-country; local processing of tuna disrupted; shortages of imported processed and packaged foods possible – both basic e.g. milk powder, tinned foods, and also highly processed foods (unhealthy discretionary foods). SMEs particularly affected.
Distribution	Restricted international trade, including exports from some countries; air freight and shipping likely to be reduced; price increase in export (non-PICT) countries raising affordability concerns for PICTs; potential backlog at ports and airports during and post-crisis.	All PICTs net-food-importers of staple (energy) foods.	Possible reductions in staple foods; shortages of imported processed and packaged foods possible (unhealthy discretionary foods); possibility to shorten supply chains including intra-regional trade.
	Impacts on internal trade and distribution due to reduced travel and quarantine measures, including restricted internal borders.	Common to have food transported between and within islands domestically; some reliance on public transport for food transport; kin networks important for sharing of food. Pacific is import-dependent for fuel.	Domestically produced food supply to urban centres reduced (e.g. root crops, fruit, vegetables); potential reductions in distribution of imported food to rural areas; likely differential impacts for producers (e.g. based on geographical location, own transport); home gardening won't be affected. Any disruptions to fuel imports could impact stove fuels for cooking.
Food market	Fresh food markets reduced due to restrictions on gatherings; food safety concerns (hygiene). Closure of farmers' markets and stalls for selling fresh fruit	Open markets major source fresh fruit and vegetables, meat etc.; hygiene and food safety may be an issue.	Access to and consumption of fresh food may be reduced in urban areas; If livelihoods affected, food security and/or ability to purchase different food may be



**Table 1** (continued)

Global analysis of potential COVID-19 related impacts on food systems	Pacific-specific food system context	Potential food system, food security and nutrition impacts in Pacific
and vegetables increase food waste and reduce farmers' ability to sell food and thus have a stable livelihood; reduce the ability of consumers to access fresh fruit and vegetables.		affected; non-cash food economies likely to become more important in village economies; gendered impacts are evident from the restriction in informal marketing, with women and youths most commonly taking up economic activities for sale of subsistence produce in the margins of the formal economy.
Potential supply concerns for supermarkets, may be price gouging; commodity prices could also fall due to a lack of demand. Types of foods consumed could change in response to change in prices.	Small stores a major source of food in region; supermarkets important source of food in urban areas.	Stores and supermarkets may be unable to source some stocks and prices may increase for goods in short supply. Differential impacts rural/urban and differences between PICTs; price gouging may impact food security.
Declines in food eaten away from home with physical/social isolation public health measures.	Informal food service significant in economy.	Informal sector may be unable to access (physical/financial) food ingredients; SMEs likely to be particularly affected. Dietary changes both positive (reduced 'fast' food), and negative (reduced dietary diversity).
Probable shift to long-shelf-life and staple foods with changed shopping behaviour due to physical distancing efforts; reduced consumption of fresh vegetables and other perishable products.	Limited storage capacities for fresh foods, particularly in low income areas.	Greater consumption of staple and processed foods may exacerbate diet transition, mediated by availability, accessibility, affordability of the substitute food and dietary habits.
Food substitution and access issues will differentially impact women and children.	Intra-household power dynamics very influential to food distribution in the Pacific region.	Increase in domestic violence and conflict within households could increase food insecurity for vulnerable groups.

Table derived from the Global Alliance for Improved Nutrition's 'The COVID-19 Crisis and Food Systems: probable impacts and potential mitigation and adaptation responses' (Haddad et al. 2020b), and informed by Aqorau 2020; Eriksson et al. 2020; Food and Agriculture Organization of the United Nations 2020c; Haddad et al. 2020a; High Level Panel of Experts on Food Security and Nutrition 2020; Husain et al. 2020; Wood 2020

for example, women comprise the majority of sellers in such markets now disrupted due to COVID-19 related restrictions, with knock-on effects on household and village economies (Eriksson et al. 2020). As market places are changing, traditional practices of bartering and sharing are also on the rise (Maclellan 2020). The existing challenges of agricultural production and a high degree of food import dependence within the region have the potential to exacerbate the impacts of COVID-19 responses. Given the nature of imported foods, it is not axiomatic that COVID-19 will lead to a reduction in the quality of diets.

Extreme necessity can be a time for positive policy innovation. Our summary (Table 1) identifies some potential positive intersections that could prompt re-visioning of aspects of the food system in the region. The great diversity among PICTs in their economies, societies and environments will be an important guide to planning interventions and developing scenarios of alternative futures. Papua New Guinea, Fiji, Solomon Islands, and other larger nations may envision futures with a resurgent agricultural base. In Solomon Islands, for example, growing conditions are favourable for a range of

crops, and a majority of households are engaged in agriculture in some way on the estimated 1.1 million hectares of agricultural land in use (Solomon Islands National Statistics Office et al. 2019). Such a future is less plausible for the atoll nations of Micronesia where the production, trade, and consumption of fish, particularly tuna sourced through potentially very long supply chains, is more likely to be prominent.

Bolstering regional production and intraregional trade in a currently import-dependent region could strengthen the regional economy, and provide the health benefits of consuming locally produced fresh foods – as well as decreasing reliance on global supply chains. Significant production, processing and storage challenges remain and would need to be consistently overcome to influence a move away from shelf-stable foods, particularly during periods when human movement is restricted and during post-disaster recovery. Supply chains vary in complexity and vulnerability to disruption. Their ability to respond quickly will depend on many factors including characteristics of the food itself, resilience of the distribution chains, and a preparedness to change. There is an opportunity to adapt supply chains in response to COVID-19 by building

on responses to climate change and natural disasters (Cvitanovic et al. 2016) which will mean supply chains are more resilient in the long-term. These include increasing co-ordination and transparency of food trade within the region (Steiner et al. 2020), particularly for root crops; ensuring access to finance and inputs to increase local production; better integration of local food producers into local and regional value chains; and increased local processing and packaging to reduce food waste (Table 1).

Enhancing storage, processing, and distribution of food commodities is vital in mitigating food and nutrition security impacts during the current crisis. For example, strengthening food storage and inter- and intra-island transport has been shown to increase consumption of fresh foods (and thus avert mortality and morbidity from diet-related non-communicable diseases) in Fiji (Snowdon et al. 2011). There may also be benefits to prioritising less perishable food (e.g. root crops) in Pacific supply chains, which lack adequate storage for more perishable items such as fish. Strengthening consumer demand has also been shown to enhance supply and demand systems and reduce post-harvest food waste (Underhill et al. 2017). Education for behaviour change has the potential to increase demand for locally produced foods (Cvitanovic et al. 2016; Vermeulen et al. 2019).

Working through COVID-19 may strengthen the ability of sectors to work together in more integrated ways; discussions around food and food systems must intersect with health and the environment (Bennett et al. 2020). For example, recent analysis from the UK on the impact of COVID-19 on food systems (Sharpe et al. 2020) has shown that “... *government reactions to food supply issues exposed how increased co-ordination could aid responses and build trust in times of crisis, both now and in the future.*”

Before COVID-19 the Pacific food system had become increasingly vulnerable to shocks and other disruptions to the production, distribution and acquisition of food. It had become that way for a multitude of historical and contemporary reasons and was already threatened by climate change and other external threats. Like climate change, the pandemic was created somewhere else, but threatens the prosperity and wellbeing of Pacific people in profound ways. Unlike climate change, the resilient people of the Pacific region can influence how this crisis plays out: whether it will catalyse change in the functioning of national food systems and their reliance on imported foods will be a critical issue in the coming years.

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## Compliance with ethical standards

**Conflicts of interest/competing interests** The authors declare no conflicts of interest

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an International Non-Governmental Organisation researching on ways to promote food and nutrition security in the Pacific food system to address the double burden of malnutrition in Solomon Islands and Vanuatu. She is based in Honiara, Solomon Islands and has contributed to a range of multi-sectoral nutrition-related policies and research.

**Dr. Penny Farrell** is a public health researcher and veterinarian with over seven years of experience in health, nutrition, and agriculture policy research in Pacific Island Countries, Asia, and Africa. Penny recently completed a PhD on food security in the Pacific region and has worked previously in the not-for-profit, university, and government sectors. Penny currently holds a position as a Research Fellow at The University of Sydney dedicated to researching how to build healthy

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**Ms. Penina Vatucaawaqa** is a National Policy Officer in Food and Nutrition Security with the Food and Agriculture Organisation (FAO) working for the Food and Nutrition Security, Impact, Resilience, Sustainability and Transformation (FIRST) Project in Fiji. Her work with FAO FIRST includes providing government with policy assistance and capacity development in support of improved food security, nutrition and sustainable agriculture in Fiji. Ms. Vatucaawaqa has also had a wide

experience in conducting nutrition research such as National Nutrition Surveys and Food Balance Sheets (a tool for assessing food availability) that has been used for developing policies in the country.



**Dr. Tom Brewer** is an interdisciplinary scientist with training in marine ecology and a Ph D in environmental sociology. He has been working in the Pacific for over a decade on natural resource management and human development challenges. His primary skill is in integration of diverse data sources to answer complex social-ecological questions relating to resource sustainability and human wellbeing. Tom is currently part of a team focused on improving food systems in the Pacific (ACIAR FIS-

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**Mr. Michael K. Sharp** is an Economic Statistics and Microdata Specialist at the Pacific Community (SPC). Mike has worked at SPC for 9-years where he has supported 22 Pacific Island countries and territories (PICTs) to collect, compile and analyse development microdata, which range from fisheries and agricultural to nationally representative census and survey data. His research interests mainly surround survey methodology to extend the use of household in-

come and expenditure survey data to conduct poverty, food security and nutrition analysis in order to form an evidence base to address hardship and malnutrition in the Pacific region. Mike previously conducted fieldwork in Vanuatu and Guyana and he was employed in the Australian financial sector. He holds a master's degree in economics and a bachelor's degree in agricultural economics. Mike is an Honorary Fellow with the Faculty of Law, Humanities and the Arts, University of Wollongong.



**Dr. Anna Farmery** is a Vice Chancellor's Post-Doctoral Research Fellow at the Australian National Centre for Ocean Resources and Security (ANCORS) at the University of Wollongong in Australia. Her research is focussed on the integration of food and nutrition security considerations in ocean and fisheries governance, and on ways to improve the overall contribution of seafood to food and nutrition security in terms of sustainable, equitable and rational resource

use. She has published articles on issues of seafood sustainability and fisheries management, and on the integration of fish and food policies. Anna has worked on aspects of sustainable food systems, in agriculture and fisheries, for over 20 years and is currently investigating value chains and Pacific food systems.



**Dr. Helen Trevena** has experience of working in the business, non-government, and government sectors in operational, consulting and policy roles. She is currently an Early Career Research Fellow at the Menzies Centre for Health Policy where her research interest is policy to deliver a healthier food supply. Helen is supported by a co-funded National Health and Medical Research Council and Heart Foundation Early Career Fellowship.



**Ms. Erica Reeve** is a PhD candidate with GLOBE at Deakin University. She has over 17 years of work experience in public health nutrition in the Asia Pacific region and remote Australian indigenous communities which includes extensive experience working with and consulting to national governments and international organisations. She has experience in strategic policy development, stakeholder engagement, programme planning, health promotion and high-

level advocacy, particularly as applied to diets, NCDs reduction, and maternal and child nutrition.



**Mr. Hampus Eriksson** is a systems ecologist. He is the Senior Scientist at WorldFish, a CGIAR centre, in Solomon Islands and an Associate Professor at the Australian National Centre for Ocean Resources and Security (ANCORS) at the University of Wollongong in Australia. His research focuses on rural development through fish-based livelihoods; testing and evaluating innovations that enhance fish-based livelihoods in small-scale fisheries. The research is implemented

through cross-disciplinary collaborations in the academic and fisheries sector in the Pacific Islands, Southeast Asia and Africa.



**Ms. Itziar Gonzalez** joined FAO in February 2016 as a policy officer for Food Security, Nutrition and Sustainable Agriculture, working first in Sri Lanka and then in three Pacific countries Vanuatu, Solomon Islands and Fiji. Prior to this position, Itziar spent over 20 years implementing and providing technical advice to rural development initiatives in different countries of South and Central America and the Caribbean. During these years, she was involved in different

Development initiatives from the United Nations, the Spanish Agency for International Development Cooperation, and some Spanish NGOs, amassing knowledge on different areas of expertise, as integral farming, food systems and nutrition sensitive agriculture, community forestry or artisanal fisheries and aquaculture. She is an agricultural engineer from the Polytechnic University of Madrid, Spain and obtained an MSc in Management of Agro-ecological Knowledge and Social Change from the University of Wageningen, The Netherlands in 2005.



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**Dr. Jacob Eurich** is a Postdoctoral Scholar at the Marine Science Institute at University of California, Santa Barbara. In 2018 he obtained his PhD from James Cook University and the Australia Research Council Centre of Excellence for Coral Reef Studies. He worked from Papua New Guinea to the Great Barrier Reef studying reef fish population and community responses to changes in habitat structure and coral bleaching.

His research now focuses on the

interactions between coral reefs and human communities in the Pacific region under the overarching themes of climate change, human use and resilience. Specifically, how much coral reef-derived foods matter to human health and the effective reef management practices that lead to levels and types of seafood consumption that promote human nutrition.



**Neil Andrew** is a Professor at the Australian National Centre for Ocean Resources and Security (ANCORS) at the University of Wollongong. He has worked at the interface between fisheries and ecological research and policy for more than 30 years in a wide range of contexts, including in Australia, New Zealand, Zambia, Malawi and in the Pacific region. Before joining ANCORS he worked as the global program leader in small-scale

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