OTAGO GLOBAL HEALTH INSTITUTE
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UNIVERSITY of OTAGO
Te Whare Wānanga o Otāgo
NEW ZEALAND
WELLINGTON

PROGRAMME

Global health in the era of climate change

Otago Global Health Institute 12th Annual Conference

6–7 November 2019 | Small Lecture Theatre, University of Otago, Wellington

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#OGHI2019

Wednesday 6 November 2019

12:00pm	**Lunch**
	Opening **Chair: Professor Richard Edwards**
12:45pm	**Mihi Whakatau: Toa Waaka** *Rautaki Hononga Māori – Māori Strategic Framework Project Manager* **Professor Sunny Collings** *Dean of School, University of Otago Wellington* **Dr Dianne Sika-Paotonu** *Associate Dean (Pacific), University of Otago, Wellington* **Dr Patrick Vakaoti** *Co-Director, Otago Global Health Institute*
1:10pm	**Toa Waaka** *University of Otago, Wellington* Whakawhanaungatanga Mo Te Ao - Relationship building with an indigenous Māori lens
	Opening address
1:25pm	**Invited Speaker: Professor Diana Sarfati** *University of Otago, Wellington* Cancer control in the Pacific
	Session 1 Infectious diseases (1) **Chair: Professor Miguel Quiñones-Mateu**
1:45pm	**Dr Ayesha Verrall** *University of Otago, Wellington* *Mycobacterium tuberculosis* Beijing genotype infection and its interaction with BCG vaccine protection: A case contact cohort study
2:00pm	**Siobhan Uruamo** *Waikato District Health Board* Methods and early findings of a feasibility study of latent tuberculosis in the Māori population of Waikato
2:15pm	**Dr Sue McAllister** *University of Otago* High tuberculosis incidence among people living with diabetes in Indonesia
2:30pm	**Dr Michael Maze** *University of Otago, Christchurch* Melioidosis and serological evidence of exposure to *Burkholderia pseudomallei* among patients with fever in northern Tanzania
2:45pm	**Questions/discussion**
3:00–3:30pm	**Afternoon tea**
	Session 2 Healthcare delivery and systems **Chair: Jacqui Hadingham**
3:30pm	**Romulo Nieva** *University of Otago* Reproductive health predicament among women in prisons: A systematic review
3:45pm	**Dr Sue McAllister** *University of Otago* Out-of-pocket costs for patients diagnosed with tuberculosis in public and private health settings in Bandung, Indonesia
4:00pm	**Sumera Akhtar** *University of Otago* Experiences of Pakistani women immigrants with New Zealand's health system
4:15pm	**Jade Jackson** *The Fred Hollows Foundation NZ* Solar-powered eye care delivery in the Solomon Islands
4:30pm	**Dr Jim Stacey** *Christchurch Hospital* How do traditional healers perceive and treat seizures? A qualitative study in northern Tanzania
4:45pm	**Questions/discussion**
5:00–5:25pm	**Nibbles and networking**
5:30pm	**2019 McAuley Oration** **Responding to the dual crises threatening health in the Pacific Islands** *Dr Colin Tukuitonga, Director-General, Secretariat of the Pacific Community* *Nordmeyer Lecture Theatre*
7:00pm	**Conference dinner (optional – for those registered)** *Trattoria, Mediterranean Foods, 42 Constable Street, Newtown*

Thursday 7 November 2019

Session 3 Pacific research (1) Chair: Dr Patrick Vakaoti

9:00am	**Invited Speaker: Dr Colin Tukuitonga** *Pacific Community (SPC)* The state of the NCD epidemic in the Pacific
9:25am	**Sarah Nelson** *University of Sydney* Water resource management for health and sustainability in Fiji: A cross case analysis
9:40am	**Dr Viliami Puloka** *University of Otago, Wellington* Exploring the me'akai Tongan children eat in Ha'apai using wearable cameras
9:55am	**Dr Moira Smith** *University of Otago, Wellington* Tongan children's beverage availability and consumption: A wearable camera study
10:10am	**Cameron Toogood** *University of Otago, Wellington* Our changing climate: Health inequity in the Pacific
10:25am	**Questions/discussion**
10:40-11:10am	**Morning tea**

Session 4 Policy, culture and education Chair: Professor Philip Hill

11:10am	**Dr John Shaver** *University of Otago* How do extreme ritual practices impact psychophysiological well-being? Findings from a Tamil Hindu kavadi ritual in Mauritius
11:25am	**Dr Judith McCool** *University of Auckland* The overseas medical elective programme: What factors influence student placement in high- versus low- and middle-income countries?
11:40am	**Dr Hera Cook** *University of Otago, Wellington* Influence of the gun lobby on politics and firearms policy in New Zealand
11:55am	**Dr Jerram Bateman** *University of Otago* The state of tobacco control in Sierra Leone: An exploratory study
12:10pm	**Questions/discussion**
12:30–1:30pm	**Lunch**

Session 5 Pacific research (2) Chair: Dr Patrick Vakaoti

1:30pm	**Dr Adriu Naduva** *University of Otago* What is in a name? Defining child sexual abuse in Fiji
1:45pm	**Professor Tord Kjellstrom** *Health and Environment International Trust* Global health monitoring via Lancet Countdown: examples of increasing heat impacts on occupational health in Pacific countries
2:00pm	**Avelina Rokoduru** *Fiji National University* Strengthening and supporting impactful research in the Pacific Islands countries
2:15pm	**Lupeoletalalelei Isaia** *University of Otago* Antimicrobial susceptibility profiles of gram-negative bacteria and *Staphylococcus aureus* isolated from Tupua Tamasese Mea'ole Hospital, Samoa, 2014–2018
2:30pm	**Questions/discussion**
2:45–3:15pm	**Afternoon tea**

Please turn over

Thursday 7 November 2019 continued

Session 6 Infectious diseases (2) Chair: Professor John Crump

3:15pm	**Invited Speaker: Professor Jo Sharp** *University of St Andrews* Drivers of change in livestock systems in Tanzania: Potential implications for community health
3:35pm	**Dr Christian Marchello** *University of Otago* Global antimicrobial resistance in *Salmonella* Typhi: A systematic review
3:50pm	**Dr Susan Heydon** *University of Otago* Implementing global health policy: Laying the foundations for smallpox eradication in Nepal
4:05pm	**Dr Moira Smith and Dr Viliami Puloka** *University of Otago, Wellington* Identifying infectious disease hazards in Tongan children's environments using wearable cameras
4:20pm	**Questions/discussion**

Closing Chair: Professor Richard Edwards

4:45pm	**Student presentation prizes**
5:00pm	**Close**

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MYCOBACTERIUM TUBERCULOSIS BEIJING GENOTYPE INFECTION AND ITS INTERACTION WITH BCG VACCINE PROTECTION: A CASE CONTACT COHORT STUDY

Ayesha J. Verrall[1], Lidya Chaidir[2,3], Carolien Ruesen[4] , Lika Apriani[2,5], James E. Ussher[6], Arjan van Laarhoven[4], Raspati C. Koesoemadinata[2,7], Dwi F Ratnaningsih[2], Rovina Ruslami[2,3], Martijn Huynen[8], Mihai G. Netea[4,9,10], Jakko van Ingen[11], Katrina Sharples[12], Reinout van Crevel*[4,13], Bachti Alisjahbana*[2,14], Philip C. Hill*[15]

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[15]Centre for International Health, Department of Preventive and Social Medicine, University of Otago, Dunedin, New Zealand.

Background: Beijing genotype strains of *Mycobacterium tuberculosis* have spread across the globe. Emergence in parallel with widespread BCG vaccination has led to speculation that they could evade BCG-induced host protection. We assessed infection with *M. tuberculosis* Beijing and other strains and their relationship to BCG vaccination in tuberculosis (TB) case contacts.

Methods: Indonesian household contacts of smear-positive TB cases with a negative Interferon Gamma Release Assay (IGRA) at enrolment had another IGRA after 14 weeks. BCG vaccination was assessed by presence of a scar. Index case *M. tuberculosis* genotype was determined by whole genome sequencing. Associations between *M. tuberculosis* genotype and IGRA conversion were assessed using a multilevel model.

Results: Of 383 contacts of 200 index cases, 108 (28·2%) converted their IGRA. The risk of IGRA conversion was higher for contacts exposed to a Beijing genotype than to other strains (adjusted relative risk [RR]=1·39; 95% CI 1·00–1·93; p=0·048). The RR of IGRA conversion according to BCG vaccination in contacts differed by genotype (p=0·01): for contacts exposed to non-Beijing stains the adjusted RR was 0·40 (95% CI 0·27-0·61; p<0·001) whereas for those exposed to Beijing stains it was 1·02 (0·56–1·85; p=0·9).

Conclusions: In TB contacts, *M. tuberculosis* Beijing genotype strains are more likely to cause infection. Furthermore, if there is any protective effect of BCG against infection with Beijing strains, it is significantly smaller than that against non-Beijing strains. New TB vaccines should be assessed in populations where Beijing genotypes are prevalent.

METHODS AND EARLY FINDINGS OF A FEASIBILITY STUDY OF LATENT TUBERCULOSIS IN THE MAORI POPULATION IN WAIKATO

Authors: Siobhan A Uruamo, Sue McAllister, Robert Hancox, Joanne Baxter, Philip Hill
The Department of Respiratory Research, Waikato District Health Board, Hamilton New Zealand; Centre for International Health, Māori Health Workforce Development Unit, and Department of Preventative and Social Medicine, University of Otago, Dunedin, New Zealand.

Background: This feasibility study looks at latent tuberculosis infection (LTBI) in the Māori population in the Waikato region of New Zealand. The purpose of the study is to determine the feasibility of estimating the age-specific prevalence of LTBI in Māori population in New Zealand. The hypothesis is that, due to the historical background of tuberculosis in New Zealand there could be a reservoir of LTBI in the older Māori population in particular.
The study design is a descriptive cross sectional study. The study population are self-identified Māori who live within the Waikato DHB catchment area from the age of 1 year old. Ethical considerations include applications to the Otago University health ethics committee, Ngai Tahu and the New Zealand health and disability ethics committee.
Methods: Data are being collected using the following three approaches. The first approach includes locating Maori living in Waikato region using the New Zealand electoral roll. Early results suggest that this is approach of itself fails to obtain a representative sample Māori in the community, largely because of frequent change of address. The second approach involves working with the New Zealand Corrections department to recruit participants that have been incarcerated. Two hundred participants in one prison are being recruited. Early results from the first 45 recruits suggest that recruitment is relatively successful, while there is little evidence of infection. The third approach arose out of a consultative process with key stakeholders and comprises recruiting participants at Māori events and the ihub which is a drop-in centre located at the hospital.
All consented participants are given an explanation of the study; a questionnaire to complete that includes demographic details and medical history; and a tuberculin skin test (TST) is then administered and checked 48 and 72 hours later.
Results: To date we have recruited 112 participants, two of which have had a positive result. The latest results will be presented at the conference.

HIGH TUBERCULOSIS INCIDENCE AMONG PEOPLE LIVING WITH DIABETES IN INDONESIA

Susan M. McAllister[1], Raspati C. Koesoemadinata[2,3], Prayudi Santoso[2,4], Nanny N.M. Soetedjo[2,4], Abdul Kamil[2], Hikmat Permana[4], Rovina Ruslami[2,5], Julia A. Critchley[6], Reinout van Crevel[7], Philip C. Hill[1], Bachti Alisjahbana[2,4]
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[7]Radboud University Medical Centre, Department of Internal Medicine and Radboud Centre of Infectious Diseases, Nijmegen, The Netherlands

Background: Data regarding TB incidence among people living with diabetes (PLWD) in TB-endemic settings are scarce. We examined TB incidence among PLWD in Indonesia who had previously been screened for latent TB infection (LTBI) and TB disease.
Methods: PLWD (aged ≥18 years) in an urban setting were examined a mean 3.4 years after they had been screened for active TB and LTBI. Data on subsequent TB diagnosis were collected by interview, and with chest x-ray, sputum smear and *M. tuberculosis* culture. TB incidence rates and 95% confidence intervals were calculated per 1000 person-years and were stratified for baseline LTBI status, as determined by quantiferon interferon gamma release assay (IGRA).
Results: Of 590 PLWD, 101 had died and 163 could not be contacted or refused. Among 326 re-examined, six (1.8%; 95% CI 0.7-4.0) reported being already diagnosed since their baseline examination, and a further five were diagnosed with active TB (1.5%; 95% CI 0.50-3.5). The TB incidence rate was 9.85 (95% CI 4.03-15.68) per 1000 person-years. TB incidence was higher among PLWD with baseline LTBI (17.13; 95% CI 5.25-29.00 / 1000 person-years) compared to those without LTBI (4.79; 95% CI -0.63-10.21), with an incidence rate ratio of 3.57 (95% CI 0.86-20.92, p=0.054).
Conclusion: This study supports the need for a randomised controlled trial of TB preventive therapy in PLWD in Indonesia and/or similar settings, and provides important data on incidence and death rates to inform the study design.

MELIOIDOSIS AND SEROLOGICAL EVIDENCE OF EXPOSURE TO *BURKHOLDERIA PSEUDOMALLEI* AMONG PATIENTS WITH FEVER, NORTHERN TANZANIA

Michael J. Maze[1], Mindy Glass Elrod[2], Alex Hoffmaster[2], Holly M. Biggs[3], Philoteus Sakasaka[4], Wilbrod Saganda[5], Bingileki F. Lwezaula[5], Blandina T. Mmbaga[4], Venance P. Maro[4], Matthew P. Rubach[3], John A. Crump[6]
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[6] Centre for International Health, University of Otago, Dunedin, New Zealand

Background: Prediction models indicate that melioidosis may be common in parts of East Africa, but there are few data. We evaluated the prevalence of melioidosis among patients presenting to hospital with fever in northern Tanzania.
Methods: Patients with fever were enrolled at Kilimanjaro Christian Medical Centre and Mawenzi Regional Referral Hospital 2007-08 and 2012-14. Participants had aerobic blood culture performed and bloodstream isolates were identified by conventional methods. Following testing on the API20NE (BioMérieux, Marcy-l'Étoile, France) biochemical identification system, non-glucose fermenting gram-negative bacilli were further tested by *B. pseudomallei* latex agglutination (Mahidol University, Thailand) test. Acute serum was collected at enrolment and convalescent serum 4-6 weeks later. Serum samples of a subset of participants considered at high epidemiologic risk of melioidosis was tested using *B. pseudomallei* indirect haemagglutination assay serology (IHA). We defined a confirmed case of melioidosis as isolation of *B. pseudomallei* from blood culture; probable melioidosis as a ≥4-fold rise in antibody titers between acute and convalescent sera; and seropositivity as a single antibody titer ≥40.
Results: We enrolled 2,663 participants and isolated 4 (0.2%) non-enteric gram-negative bacilli from blood culture; none were *B. pseudomallei*. We tested 323 participants by IHA. We identified no cases of confirmed melioidosis; 2 (0.6%) of probable melioidosis; and 57 (17.7%) were seropositive.

Conclusions: The high proportion of seropositive participants may suggest that either *B. pseudomallei* or an antigenically similar organism is present in northern Tanzania. Further research into the presence of *Burkholderia* spp. as a cause of illness and in the environment is warranted.

REPRODUCTIVE HEALTH PREDICAMENT AMONG WOMEN IN PRISONS: SYSTEMATIC REVIEW

Romulo F. Nieva Jr
Department of Sociology, Gender Studies and Criminology, University of Otago

Background: Incarcerated women around the globe are predominantly of reproductive age, mothers and sole carers for their children. Thus, women in prison have more unique, complex and specific health needs. This systematic literature review aims to describe the reproductive health and well-being among women in prisons.
Methods: Six electronic databases (Google Scholar, Science Direct, Proquest, PubMed, Scopus and JSTOR) were searched and from 50 publications, 12 articles met the inclusion criteria for this review. Articles were included in the review if they met the following eligibility criteria: (1) described original data-driven research, (2) were published in a peer-reviewed journal, and (3) described the reproductive health needs of women in prison.
Results: Results indicated that women had access problems to hygiene and menstrual products, essential pain medicines and iron supplements. Secondly, they had low and limited contraceptive or birth control use and access, they also exhibited unprotected sexual acts (pre-incarceration & some inside the prison). Furthermore, significant number of women were reported positive for sexually transmitted infections. Lastly, they had experienced abuse and violence while being detained and many had victimization experience prior to imprisonment.
Conclusion: The evidence is systematic and consistent that women's specific reproductive well-being needs are often not met by the prison environment. The prison system, particularly its authorities, must be sensitized about the changing demographic composition and the varying needs of the prison population. This review demonstrates that changes at the institutional and service provision levels at the prison system are critical.

OUT-OF-POCKET COSTS FOR PATIENTS DIAGNOSED WITH TUBERCULOSIS IN PUBLIC AND PRIVATE HEALTH SETTINGS IN BANDUNG, INDONESIA

Susan M. McAllister[1], Bony Wiem Lestari[2,3,4], Trudy Sullivan[5], Panji Fortuna Hadisoemarto[2,3], Nur Afifah[3], Philip C. Hill[1], Bachti Alisjahbana[3,6]
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Background: Costs related to tuberculosis (TB) can impose a significant impact on patients and their families and create barriers to diagnosis and treatment. Our study aimed to quantify out-of-pocket costs expended by TB patients in Bandung, Indonesia.
Methods: This cross-sectional study recruited adults diagnosed with TB from Community Health Centres (CHCs), public and private hospitals, and private practitioners (PP). An interview was completed at the time of diagnosis, or

at their return for 2- or 6-month treatment. Costs were converted to US dollars (US$) and presented as mean, median and interquartile range (IQR).

Results: Of 469 TB patients recruited: mean age was 38 years; 57% were male, and the median pre-treatment direct cost per person was $37.51 (IQR 20.79-71.24). Hospitalisation, diagnostic test and travel costs were predominant. Not having insurance ($41.88 vs. $27.41, p<0.001), ≥6 visits to a healthcare provider ($39.91 vs. $24.32, p<0.001), ≥60 days before diagnosis ($36.35 vs. $26.25, p<0.021), and presenting first to a PP ($40.71) or informal provider ($32.72) compared to private hospital ($21.26), public hospital ($19.63) or CHC ($13.52) (p=0.011) were associated with higher pre-treatment median costs. For 106 patients with total pre- and post-treatment costs available, the median total cost was $243.66 (IQR 128.46-550.71). For 26.5% (95% CI 16.8-36.2), the total costs were ≥20% of their annual household income.

Conclusion: Despite having a good network of free TB diagnostic and treatment services throughout Bandung, patients experienced significant out-of-pocket costs. Increased uptake of the National Insurance, and systems for early recognition and diagnosis of TB, will contribute towards reducing these costs.

EXPERIENCES OF PAKISTANI WOMEN IMMIGRANTS WITH NEW ZEALAND'S HEALTH SYSTEM

Sumera S. Akhtar[1], Susan Heydon[1], Pauline Norris[2]

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Background: This study explores the knowledge of Pakistani women immigrants about New Zealand's health system. It builds on an earlier interview-based pilot study which highlighted gaps in health literacy and underutilization of health services.

Method: An online questionnaire was developed and administered using Qualtrics© software. Closed- and open-ended questions asked about the challenges new immigrants face when entering a new healthcare system. The target population were Pakistani women aged 20 years or older, living in New Zealand for less than five years. Participants were recruited from different cities, primarily through snowball sampling using different social media. The survey was conducted in English, and responses were transcribed, collated and analysed.

Results: A total of 170 respondents (covering 798 family members) answered most questions. The average age of the participants was between 26 to 34 and most of them were housewives. New immigrants considered it difficult to access information about medical centres, GP registration, subsidies for medicines, maternity services, emergency/ after-hours services, mental health for children and adults as well as dental care for children. Most participants stated that they obtained information about the healthcare system from friends and searching on Google. New immigrants particularly felt they needed more information when they first arrived in New Zealand.

Conclusion: New immigrants face challenges with finding information about New Zealand's health system and this impacted on accessing healthcare for themselves and their families. Information is particularly needed before or soon after arrival in New Zealand.

THE FRED HOLLOWS FOUNDATION NEW ZEALAND: SOLAR-POWERED EYE CARE DELIVERY IN SOLOMON ISLANDS

Jade Jackson

The Fred Hollows Foundation NZ, Auckland, New Zealand

The Fred Hollows Foundation NZ works in the Pacific, where an estimated 40,000 people are blind and many more suffer from visual impairment. The Foundation aims to eliminate avoidable blindness in this region through service

delivery, building a local workforce, strengthening local health systems and driving innovation and research. The Foundation collaborates with local stakeholders to work towards this vision.
In 2015, the Regional Eye Centre was built in Honiara, Solomon Islands to meet the eye care needs of the population. The clinic is powered by solar panels, relies entirely on rainwater and has its own sewerage treatment system. Since its launch, the clinic has carried out 62,101 consultations, performed 5,341 surgeries and dispensed 3,144 spectacles. This presentation will illustrate the initiative adopted by the Foundation to combat climate change while providing eye care services in a low-resource setting like Solomon Islands.

HOW DO TRADITIONAL HEALERS PERCEIVE AND TREAT SEIZURES? A QUALITATIVE STUDY IN NORTHERN TANZANIA

Jim Stacey[1], Claire Dickinson[2], Richard Lee[2], Ewan Hunter[3], Richard Walker[4]
[1]Christchurch Hospital
[2]Institute of Health and Society, Newcastle University
[3]London School of Hygiene and Tropical Medicine
[4]North Tyneside General Hospital; Institute of Health and Society, Newcastle University

Background: The majority of people with epilepsy (pwe) in in sub-Saharan Africa do not receive medications adequate to control their seizures. Scepticism of biomedical aetiological explanations of epilepsy and the persistence of traditional beliefs may be underlying this situation and such beliefs may also act as mediators of epilepsy-related stigma. This study aimed to examine traditional healers' understandings of seizures and their approaches to treatment.
Methods: A sample of eight traditional healers living in the Kilimanjaro region of Tanzania was identified. Participants were selected based on their willingness to collaborate, in order to provide rich, in-depth data for analysis. Semi-structured interviews based around Kleinman's questions to elicit patients' explanatory models were conducted with the help of a Kiswahili interpreter. Transcripts of interviews were analysed using a method drawn from interpretative phenomenological analysis.
Results: Traditional healers had a strong connection to the spiritual world, typically mediated though dreams. They identified both natural and spiritual causes of epilepsy and stated that whilst biomedical healthcare professionals were able to treat natural causes, only traditional healers could treat spiritual causes of disease. Spiritual causes of disease could be divided into Islamic beliefs, such as *Jinn*, and traditional African beliefs, such as witchcraft. Healers treated disease using a number of different methods simultaneously, relying on local herbs, spiritual powers and prayers.
Conclusions: The appeal of traditional healers to PWE may be due to their broad explanatory models of disease, which are more likely to overlap with those of PWE than those of biomedical healthcare professionals.

WATER RESOURCE MANAGEMENT FOR HEALTH AND SUSTAINABILITY IN FIJI: A CROSS CASE ANALYSIS

Sarah Nelson[1], Aaron Jenkins[1,2], Rachel Devi[3], Kelera Naivalu[3], Vilisi Naivalulevu[3], Joel Negin[1], Seye Abimbola[1]
[1]School of Public Health, University of Sydney, Sydney, Australia
[2] School of Sciences, Edith Cowan University, Perth, Australia
[3]WISH Fiji, Suva, Fiji

Background: A top health security priority in the Pacific Region is water-related management as disease outbreaks are increasing. Fiji has had 20 typhoid outbreaks since 2005, a 27,000-case dengue outbreak in 2013-14 and a three-fold increase in leptospirosis cases post cyclone Winston. Increased weather extremes contribute to the conditions

for vector-borne and waterborne diseases. Understanding Fijian community water resource management allows for action to manage and maintain climate-resilient water systems as challenges arise.
Methods: Semi-structured interviews were conducted at the national, provincial and community level identifying how Fijian communities manage their water resources for health and sustainability. Thematic analysis was conducted using NVIVO.
Results: Differing views on leadership, community engagement, decision-making processes and linkages between national, provincial and community levels were identified. Some communities had existing community level water management committees that provided strong local leadership and community engagement, while others had none – leading to *ad hoc* and reactive water management. Interactions between water and health sectors were variable: relatively strong at national level, but weaker at community level. Linkage strength amongst national, provincial and communities varied. Strong leadership promoted effective linkages. Decision-making mechanisms varied; some communities had active community participation with varied members including women.
Conclusion: Insight into how Fijian communities effectively manage their water resources for health and sustainability was identified. This knowledge will inform responses to natural disasters and outbreaks that crate effective decision-making mechanisms and strengthen health systems from the community, provincial and national levels, leading to a climate-resilient water system in Fiji.

EXPLORING THE ME'AKAI TONGAN CHILDREN EAT IN HA'APAI USING WEARABLE CAMERAS

Loma Linda Veatupu,[1] Viliami Puloka,[1] Moira Smith,[1] Christina McKerchar[2] & Louise Signal[1]
[1]University of Otago, Wellington, New Zealand
[2]University of Otago, Christchurch, New Zealand

Introduction: Tonga has one of the highest rates of obesity and non-communicable diseases globally. This research examines the food consumed by Tongan children in Ha'apai using wearable cameras, and the source of that food. It is one of the first studies to document food consumption in real time and an innovation in Pacific nutrition research.
Methods: Thirty-six randomly-selected 11-year-olds from the outer Tongan island of Ha'apai recorded their lives for three days. Using content analysis, the images were assessed for the participants' food consumption. Tongan researchers led the research in partnership with the Tonga government.
Results: Children consumed a mean of 4.7 (95% CI 3.3, 6.7) non-core and 2.2 (95% CI 1.8, 2.9) core foods/10h day; including 5.8 (95% CI 4.3, 8.3) snacks/10h day (4.0 (95% CI 2.5, 6.5) non-core and 1.8 (95% CI 1.3, 2.6) core). Unhealthy snack foods, e.g., raw noodles and chippies, were the most common food type consumed (1.5 (95% CI 1.1, 2.1) /10h day). The most common sources of food were the home, other children and the supermarket. On average, each child purchased one product/10h day, being nearly all non-core foods (0.9 (95% CI 3.3, 6.7)).
Discussion: This research adds to the very limited literature on Tongan children's food consumption. The findings support efforts by the Tonga government to implement a healthy school food policy and maintain or increase junk food taxes. Consideration could be given to initiatives to ban junk food importation. They are relevant for other Pacific Island nations and all nations concerned with addressing obesity.

TONGAN CHILDREN'S BEVERAGE AVAILABILITY AND CONSUMPTION: A WEARABLE CAMERA STUDY

Tevita Vaipuna[1], Viliami Puloka[1], Moira Smith[1], Louise Signal[1]
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Introduction: Sugar-sweetened beverage (SSB) availability is a key driver of SSB consumption, and subsequently, child obesity and other NCDs. Little is known about Tongan children's SSB availability and consumption. Using wearable cameras, this study objectively assessed the nature of the drinks available to and consumed by Tongan children.
Methods: Wearable cameras capturing images every 7s were worn by 38 randomly-selected Tongan children (aged 11y) from Nuku'alofa (n=19) and Ha'apai (n=19) over three days. Image data were coded and analysed using content analysis to determine the children's daily beverage availability and consumption. Tongan researchers led the research in partnership with the Tonga government.
Results: On average, beverage availability was higher for children from Nuku'alofa (12.0 (95% CI 9.8, 14.8)) than from Ha'apai (6.9 (95% CI 5.7, 8.5)). Significantly more non-core beverages (predominantly SSBs) were available to Nuku'alofa children (4.9 (95% CI 3.4, 7.1)/day) than Ha'apai children (1.2 (95% CI 0.8, 1.8)/day). Children from Nuku'alofa consumed 0.7 (95% CI 0.4, 1.2) non-core beverages/day and Ha'apai children consumed 0.5 (0.3, 0.8) non-core beverages/day. Non-core beverages were most commonly available at the fale koloa (convenience store), home and supermarket, but also available in schools.
Discussion: SSB availability and consumption were higher among Tongan children from Nuku'alofa than from Ha'apai. SSBs were available in all locations in which the children spent time. The findings support Tonga government's efforts to implement healthy drink policies and tax SSBs. Consideration could be given to increasing SSB taxes further and/or restricting/banning SSB importation. The findings are likely relevant to other Pacific Island nations.

OUR CHANGING CLIMATE: HEALTH INEQUITY IN THE PACIFIC

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Climate change is a present and ongoing threat to global health equity, both through exacerbating current inequities and generating new ones. Climate change is a globally integrated problem with regionally specific effects. From a local perspective, New Zealand is an integral part of the Pacific, and must consider the impacts on Pacific peoples within the greater New Zealand realm of Niue, Tokelau and the Cook Islands. Pacific migrants to New Zealand from other nations have personal ties to these areas, and the interconnected nature of our region necessitates Pacific partnerships and cooperation to combat these inequities. Some of the discussed inequitable health impacts include food insecurity increasing the reliance on imported and obesogenic foods, psychological impacts of cultural and homeland loss, and spread of mosquito-borne, tick-borne, and waterborne illnesses such as human myiasis, dengue, *Vibrio* gastroenteritis and Ciguatera fish poisoning. Different nations are likely to have different health impacts, aims for mitigation and adaptation, and long-term needs. Should mitigation and adaptation strategies fail, forced evacuation of islands that become uninhabitable will have major cultural, psychosocial, and physical health impacts that lead to extremely negative wellbeing outcomes. In the context of the recent September 2019 climate strikes, the largest collective national strikes in New Zealand's history, and with millions of strikers across 150 countries participating globally, the time is right to re-evaluate and deepen cooperative Pacific efforts to protect our nations' peoples.

HOW DO EXTREME RITUAL PRACTICES IMPACT PSYCHOPHYSIOLOGICAL WELL-BEING? FINDINGS FROM A TAMIL HINDU KAVADI RITUAL IN MAURITIUS

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Background: Religion exists in all known human societies. The universality of religion is puzzling, however, because religious group membership often entails substantial physiological costs to individuals. In particular, many rituals require people to undergo piercing, scarring, tattooing, and other behaviours that should negatively impact health. Informants often claim that these practices convey health benefits, but is there evidence for these claims? We investigated health outcomes of participation in one of the most extreme rituals worldwide, the kavadi in Mauritius, which involves numerous bodily piercings and prolonged physical exertion, to examine its effects on physiological and subjective health.
Methods: Over a two-month period of data collection we monitored activity and physiological responses of ritual participants and a control group, and obtained assessments of perceived health. Physiological impact of the ritual was assessed through BodyMedia SenseWear© Mini Armbands (SWM), small multi-sensor armbands that record physiological data by combining measures of electrodermal activity, temperature (skin temperature and heat flux), and acceleration of movement to estimate a wide range of indicators of general health.
Results: Participation in the ritual had no measured detrimental effects on physiological health and was associated with improvements in psychological well-being. Furthermore, individuals who experienced health problems and/or were of low socioeconomic status sought more painful levels of engagement, which were associated with greater improvements in subjective well-being.
Conclusions: Our findings suggest that people, and especially low-status individuals, may seek religious practices that seem risky or dangerous because these practices can function as effective coping strategies within their local contexts.

THE OVERSEAS MEDICAL ELECTIVE PROGRAMME: WHAT FACTORS INFLUENCE STUDENT PLACEMENT IN HIGH VERSUS LOW- AND MIDDLE-INCOME COUNTRIES

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Background: Medical electives undertaken during sixth year at medical school provide an opportunity for students to work in an overseas or New Zealand health facility to gain exposure to a health system outside their training facility. This study assessed patterns within elective choice by students' socio demographic and programme entry characteristics.
Methods: A retrospective analysis of de-identified aggregate medical elective records from 2010 to 2016 was undertaken using a Kaupapa Māori framework. Demographic variables included gender, age group, ethnicity, secondary school decile, year and route of entry (into medical school) and elective site (high versus low- and middle-

income country). Multivariable logistic regression analysis determined the odd ratios for predictors of going overseas for elective and electives taking place in a "High" (HIC) compared to "Low- and middle-income countries" (LMIC).
Results: Of the 1,101 students who participated in the medical elective, the majority undertook their elective overseas in a high-income country. Age (younger), route of entry (general) and high school decile (high) were each associated with going overseas for an elective. Pacific students were more likely (than Māori) to go overseas for their elective; Māori students who did go overseas were more likely to spend their elective in a HIC.
Conclusion: The medical elective holds an important place in the training of medical students as it can consolidate and extend clinical, professional, and personal development. A proportion of students did not take up the opportunity for an overseas elective which may reflect equitable access, particularly for MAPAS students.

THE INFLUENCE OF THE GUN LOBBY ON POLITICS AND FIREARMS POLICY IN NEW ZEALAND

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This paper considers the past thirty years of gun policy in New Zealand and considers what this reveals about the operation of influence in NZ politics and the implications for other parts of the Pacific. Ensuring effective control of firearms has been a global public health concern to which NZ has made several practical contributions, but effective regulation of firearms within NZ has been highly contentious. Following the Christchurch massacre, the term gun lobby has been used to refer to groups within New Zealand who lobby MPs to prevent new controls on firearms. The Council of Licensed Firearms Owners [COLFO] and other gun groups have discouraged use of the term. A lobby is defined as a group of persons who work or conduct a campaign to influence members of a legislature to vote according to the group's special interest. This paper shows that claims by gun owners groups to exercise influence based on their expertise are undermined by a refusal to countenance any extension to regulation and by their commitment to an ideological campaign influenced by the strategies of the USA NRA. This paper is based on the findings of a New Zealand Lotteries funded grant project that used qualitative methods, including interviews and documents.

THE STATE OF TOBACCO CONTROL IN SIERRA LEONE: AN EXPLORATORY STUDY

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Tobacco is a leading cause of non-communicable diseases globally. In order to curb the tobacco epidemic, the WHO developed and implemented the Framework Convention on Tobacco Control (FCTC). While the FCTC has led to declining tobacco use globally, the prevalence of tobacco smoking is increasing in many low- and middle income countries, particularly in Africa. Sierra Leone, a small country in West Africa, has the dubious distinction of having both the highest known prevalence of tobacco smoking, as well as the lowest known implementation rate of the FCTC, in sub-Saharan Africa. But very little else is known about the state of tobacco control in Sierra Leone, therefore it warrants further attention. Drawing on observational and qualitative field research, this paper will first highlight the ways in which tobacco is currently sold and marketed in Sierra Leone. It will then present preliminary findings from semi-structured interviews with tobacco control stakeholders in Sierra Leone, to explore the key achievements

in tobacco control since the FCTC was ratified by its government in 2009, as well as the barriers that have inhibited further progress in terms of its implementation. In doing so, it will highlight the perceived priorities for improving the FCTC implementation rate, and ultimately reducing smoking prevalence, in Sierra Leone.

WHAT IS IN A NAME? DEFINING CHILD SEXUAL ABUSE IN FIJI

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In Fiji, Child Sexual Abuse (CSA) impacts many lives. Its effect on families, communities and more so children are often irreversible and devastating. In 2018, the Social Welfare and Child Services Department reported 130 cases of child sexual abuse. This is concerning for a country that prides itself in its social and cultural safety nets. The concern is compounded by a poor response system characterized by the lack of resources, scarce information and data, sociocultural taboos around the issue and a modest political will.

A foremost challenge is the lack of a clear definition of CSA, to guide policy makers, child protection service providers and the legal system. A clear definition helps mandatory reporters like doctors, police officers, welfare officers, lawyers and teachers to accurately identify CSA victims and offer timely support. Clear definitions give due justice to victims and their families and to those who may be falsely accused. It also provides a basis for developing relevant and effective CSA related programmes and policies.

This presentation draws on a literature review evaluating existing CSA definitions. These are compared against definitions mostly legal currently used by different parties in Fiji; identifying gaps and opportunities to influence a working definition that will guide my doctoral project and subsequently the work of relevant stakeholders in Fiji.

GLOBAL HEALTH MONITORING VIA LANCET COUNTDOWN: EXAMPLES OF INCREASING HEAT IMPACTS ON OCCUPATIONAL HEALTH IN PACIFIC COUNTRIES

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Workplace heat is a well-known health hazard, which in many occupations cannot be easily prevented with existing cooling technologies. The outdoor climate conditions are in many jobs directly influencing the heat exposures while working, even indoors, and climate change will increase the heat risks for millions of people particularly in low and middle income countries in tropical areas. Many Pacific countries already have environmental heat levels capable of impairing health and work performance during long periods each year. Climate change will bring "Heat Level Rise" in addition to the catastrophic "Sea Level Rise" for Pacific countries. We contribute global estimates of annual labour capacity lost due to workplace heat to the Lancet Countdown project, and have now developed a database and analysis methods that make it possible to estimate heat effects at country level. In 2017 the global number of lost work hours due to heat was 153 billion, an increase of 62 billion since the year 2000. As the global heating continues these effects will adversely affect the economy and create substantial health challenges in many countries. For instance, in India a person working in the shade at moderate physical activity now experiences a 4.8% loss of annual work hours as they are too hot to continue work. This effect will increase to 11% by the end of the century, unless heat level rise is kept below the increases implied by current policies. A number of Pacific countries have similar

situations, and for more intensive work carried out in the sun, as much as 30% of annual work hours will be too hot in the future. We will present key approaches to health protection in these hot workplace situations, and highlight the importance of climate change mitigation at global level.

STRENGTHENING & SUPPORTING IMPACTFUL RESEARCH IN THE PACIFIC ISLANDS COUNTRIES.

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Conducting health research in Pacific Islands Countries (PICs) is fraught with its peculiar challenges so often that they discourage researchers from doing their work in a region that's desperately needing evidence-informed health policies, practice and programs. Currently, research in the region is characterized by time-bound sporadic funding from external sources; very high costs, pockets of studies conducted in mostly over-studied urban areas and sub-populations because they are easy to access; little publication of research in peer-reviewed journals, incomplete and or non-representative studies and importantly, studies whose objectives and motivations are determined by external institutions with available funds but whose priorities are often far removed from the needs of the countries or region. Implementation of recommendations from those studies often become problematic for various reasons. Identifying relevant strategies on how to implement a study once approved, appointing local focal points, building empowering research partnerships and allowing healthy consultations amongst all stakeholders, amongst others, are critical for ensuring health research is conducted and completed through a realistic budget in a timely manner, is culturally and gender-sensitive, is widely disseminated and impactful. Research purposes, processes, funding, dissemination, building research technical expertise and partnerships need to be reviewed to support impactful Pacific health research which are needed and prioritized by the countries, are proactive, facilitate or strengthen delivery of health services and improve living conditions for all.

ANTIMICROBIAL SUSCEPTIBILITY PROFILES OF GRAM-NEGATIVE BACTERIA AND STAPHYLOCOCCUS AUREUS ISOLATED FROM TUPUA TAMASESE MEA'OLE HOSPITAL, SAMOA FROM 2014-2018

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A retrospective analysis of culture and antimicrobial susceptibility results was conducted utilising microbiology records from 2014 to 2018, obtained from the Tupua Tamasese Mea'ole Hospital, Samoa. During this 5-year period, a total of 81,964 specimens were received, with 38,218 blood (46.6%), 25,669 urine (31.3%), and 18,077 general specimens (22.1%), including wound swabs and respiratory specimens. Coagulase-negative *Staphylococcus* spp. (4473, 18.3%) and *S. aureus* (4368,18%) were the most commonly recovered isolates from positive cultures, followed by *Escherichia coli* (3044,12.5%) and *Klebsiella* spp (1784,7.3%).From 2014 to 2018, resistance to ceftriaxone increased from 6.5% to 24.8% and 4.9% to 14% in *K. pneumoniae* and *E. coli* respectively. Resistance to ciprofloxacin increased from 10.6% to 39.6% and 8.6% to 22.4% in *K. pneumoniae* and *E. coli* respectively. In *P. aeruginosa* and *A. baumannii*, resistance to gentamicin increased from 6.4% to 11.1% and 7.9% to 39.5% respectively. Of 78

meropenem-resistant isolates in 2017 and 71 in 2018, 48 (61.2%) and 49 (69.0%) respectively were *A. baumannii*. 35% (672/1943) of all MRSA identified were from blood cultures. The most common gram negative bacterium isolated from bloodstream infections was *S. enterica* serovar Typhi (576, 8.1%), which remained universally susceptible to all antibiotics during this 5 year period.

These results show increasing clinically significant antimicrobial resistance in bacteria causing infections in Samoa, highlighting the need for regular analysis of local susceptibility patterns to inform appropriate empiric antibiotic recommendations. Furthermore, strict antimicrobial stewardship is an urgent priority to ensure optimal use of available antimicrobials for treatment of severe infections.

GLOBAL ANTIMICROBIAL RESISTANCE IN *SALMONELLA* TYPHI: A SYSTEMATIC REVIEW

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Background. Understanding temporal trends of antimicrobial resistance (AMR) in *Salmonella* Typhi can guide empiric treatment recommendations and contribute to country decisions about typhoid conjugate vaccine introduction.

Methods. We systematically reviewed PubMed and Web of Science for articles worldwide from any time period on the AMR of *Salmonella* Typhi. Articles reporting the proportion of isolates non-susceptible to individual antimicrobials were included. We excluded articles if we were unable to stratify *Salmonella* Typhi isolated from normally sterile sites or if we were unable to calculate proportions from the data provided. Isolates resistant to first-line antimicrobials ampicillin, chloramphenicol, and trimethoprim/sulfamethoxazole were classified as multidrug resistant (MDR).

Results. Among the 198 articles eligible for analysis, data were collected from 1972 through 2018 in 38 countries and tested 56,374 *Salmonella* Typhi isolates. Across the time periods 1972-1999, 2000-2009, and 2010-2018 among studies located in Asia, the proportion of isolates resistant (resistant/total tested) to ciprofloxacin was 3.6% (219/6,001), 3.1% (439/14,270), 41.1% (4,670/11,349) (X^2=5469, p<0.001), ceftriaxone was 2.4% (124/5,129), 0.4% (47/12,991), 1.9% (266/13,970) (X^2=2.08; p=0.1487), and MDR was 34.4% (2,001/5,820), 26.9% (2,794/10,384), 35.0% (5,487/15,661) (X^2=23.93; p<0.001), respectively. For the same time periods among studies in Africa, ciprofloxacin was 0.0% (0/133), 1.2% (14/1,209), 1.2% (39/3,228) (X^2=0.67, p=0.414), ceftriaxone was 0.0% (0/55), 0.7% (8/1,160), 0.2% (5/2,212) (X^2=2.94; p=0.086), and MDR was 0.0% (0/37), 21.3% (226/1,060), and 75.1% (2,173/2,895) (X^2=976.57; p<0.001), respectively.

Conclusions. Increased surveillance of antimicrobial use and resistance, and introduction of typhoid conjugate vaccine in endemic regions is recommended to improve disease control.

IMPLEMENTING GLOBAL HEALTH POLICY – LAYING THE FOUNDATIONS FOR SMALLPOX ERADICATION IN NEPAL

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Smallpox remains the only human disease to have been eradicated. This success in 1980 is still portrayed widely as a triumph of cooperation between countries. The World Health Assembly provided the forum to agree on a global health goal and the World Health Organization (WHO) had the necessary links with national authorities to coordinate and implement a policy, and to draw on international 'scientific' expertise.

Nepal was one of the last small group of countries to eradicate smallpox. Epidemic smallpox in 1963 revealed the fractured, limited yet global world of responses to the disease in Nepal, a country with enormous communication challenges and very limited infrastructure. One of these responses was the joint government of Nepal/WHO

Smallpox Control Pilot Project begun in 1962 in the Kathmandu Valley. Despite many problems leading to strong criticism in the later official history of the worldwide smallpox eradication programme, this pilot project provided the foundation on which Nepal's first nationwide health programme developed and led to smallpox being declared eradicated from the country in 1977.

IDENTIFYING INFECTIOUS DISEASE HAZARDS IN TONGAN CHILDREN'S ENVIRONMENTS USING WEARABLE CAMERAS

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Background: In Tonga, infectious diseases remain an important health problem, despite a reduction in incidence in recent decades that is largely due to public health actions. Information on infectious disease hazards in Tongan children's environments is limited. This study explored the nature and extent of Tongan children's exposure to such factors in their everyday lives, and public health intervention to reduce risk.
Methods: Data were collected by 108 randomly-selected Tongan children (10-12y) who wore wearable cameras for three days that captured images (total approx. 980,000) of their surroundings every 7s. Each image was systematically examined and coded for infectious disease hazards in the children's day-to-day surroundings. The data were analysed to determine the nature and frequency of exposure in their home, school, recreational and church environments. Tongan researchers led the research in partnership with the Tonga government.
Results: Children were exposed to a range of infectious disease hazards throughout their day, in all the settings in which they spent time. Most common were food and beverage packaging litter that collects water and supports mosquito breeding; lack of barriers to insects entering homes and schools; inadequate rubbish storage and disposal; presence of free-roaming animals; and bed and food sharing.
Conclusions: Wearable cameras provide a unique and unprecedented opportunity to investigate the nature of environmental infectious disease hazards. A range of such hazards, which could potentially be managed, were identified. Notable were those likely to increase the risk of vector borne diseases which are expected to be a growing threat as a result of climate change.