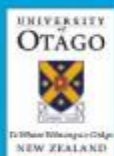


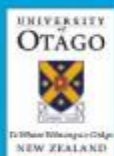
Programme		Wednesday 2 November 2016		Dunedin Public Art Gallery The Octagon, Dunedin	
Time		Session			
		Opening		Chair: John Crump	
12:45	1:00	Registration			
1:00	1:15	Housekeeping, Professor John Crump			
		Welcome - Mayor of Dunedin, Dave Cull			
		Global health perspective 2016: Professor Richard Edwards			
Session 1		Non communicable diseases I		Chair: Tony Binns	
1:15	1:30	Lindsay Robertson, An evaluation of compliance, knowledge, and attitudes to 100% smoke-free law in bars and restaurants, Kampala, Uganda			
1:30	1:45	Murat Üngör, Structural transformation and economic development in low-income countries: a research agenda and implications for improved health worldwide			
1:45	2:00	Sneha Lakhotia, Determinants of menstrual hygiene practices and health among adolescent girls, Gujarat, India			
2:00	2:15	Jennifer Desrosiers, The role of faith-based organisations in preventing and responding to sexual, intimate partner, and gender-based violence in conflict settings			
2:15	2:30	Jacqueline Leckie, In the media eye: mental illness and care in Fiji			
2:30	2:45	Plenary discussion			
2:45	3:15	Afternoon coffee			
Session 2		Non communicable diseases II		Chair: Richard Edwards	
3:15	3:30	Michael Knapp, Genetic analysis of ancient pathogens in the Pacific: why we can and why we should			
3:30	3:45	Shyamala Nada-Raja, International students' psychological wellbeing: findings from an exploratory study			
3:45	4:45	Student presentations			
		Daniel Coppersmith, The state of suicide research in low-income countries: a systematic review			
		Saeideh Babashahi, Priority-setting as a priority in global health			
		Noah Bunkley, A pilot survey on access to surgical care in Vanuatu			
		Deborah McIntosh, Multiple micronutrient deficiencies among young Indian children aged 12-24 months living in the slums of New Delhi			
		Aly Diana, Relationship between WHO infant and young child feeding indicators, nutrient adequacy, and growth in infants aged 6, 9, and 12 months from Sumedang District, West Java Province, Indonesia			
		Xiang Zou, Health care for elders in rural southern China: an integrated bioethical and anthropological study			
		Gail Elliott, Growth and development in the agricultural transition in pre-Hispanic northern Chile			
		Lenette Breytenbach, Neolithic health: an assessment of animal-health interaction in prehistoric Vietnam			
4:45	5:00	Plenary discussion			
		Optional Conference Dinner			
6:00	8:00	Gaslight Restaurant - 73 St Andrew Street, Dunedin 9016			





Programme		Thursday 3 November 2016		Dunedin Public Art Gallery The Octagon, Dunedin	
Time		Session			
<b>Session 3</b>		<b>Infectious diseases I</b>		<b>Chair: David Fielding</b>	
9:00	9:15	Philip Hill, Impact and effectiveness of pneumococcal vaccination on childhood pneumonia in The Gambia			
9:15	9:30	Effua Usuf, Trends in nasopharyngeal pneumococcal carriage serotypes five years after PCV13 introduction in The Gambia			
9:30	9:45	Sue McAllister, Feasibility study of active case-finding approaches for tuberculosis in Bandung City, Indonesia			
9:45	10:00	Bruce Russell, The last malaria parasite standing: Challenges in eliminating 'relapsing malaria'			
10:00	10:15	Hallie Buckley, The antiquity of treponemal disease in South East Asia and the Pacific: palaeopathology research on the disease and implications for settlement history and modern health			
10:15	10:30	Macandrew Bay School artwork			
10:30	11:00	<b>Morning coffee</b>			
<b>Session 4</b>		<b>Global Health Link Otago</b>		<b>Chair: Susan Jack</b>	
11:00	11:15	Faafetai Sopoaga, University of Otago engagement in the Pacific			
11:15	11:30	Andrew Miller, A Global Health Classroom (GHCR): collaborative case-based small-group learning activities between medical students and PAHS Medical School, Nepal, and University of Otago Christchurch, New Zealand			
11:30	11:45	Kristin Voigt, Rethinking the role of data in allocating global health aid			
11:45	12:00	Amelia Ganefianty and Agung Budi Sutiono, The Bandung Neurosurgery Patient Outcomes Project, Indonesia			
12:00	12:15	Sue McAllister, Using the EQ-5D-5L to assess health-related quality of life – what does it tell us? Examples from two studies in Bandung, Indonesia			
12:15	12:30	Plenary discussion			
12:30	1:30	<b>Lunch</b>			
<b>Session 5</b>		<b>One Health and diagnostics</b>		<b>Chair: Pauline Norris</b>	
1:30	1:45	Cord Heuer, Tracing human leptospirosis back to infecting animal species: evidence from New Zealand, Fiji, and Nepal			
1:45	2:00	Joanna McKenzie, Association of zoonotic, occupational, and environmental risk factors with clinical leptospirosis among fever patients in Kaski District, Nepal			
2:00	2:15	Peter Jolly, Environmental and demographic risk factors for scrub typhus in Bhutan			
2:15	2:30	Mark Bryan, Regional variations in antimicrobial use in farm animals and implications for One Health antimicrobial stewardship			
2:30	2:45	Jackie Benschop, Building an African leptospirosis network			
2:45	3:00	Jo-Ann Stanton, PDQeX: reliable nucleic acid extraction for in-field and point-of-care applications			
3:00	3:15	Plenary discussion			
3:15	3:45	<b>Afternoon coffee</b>			





OTAGO GLOBAL HEALTH INSTITUTE  
9TH ANNUAL CONFERENCE  
2 – 3 NOVEMBER 2016  
DUNEDIN  
TE HUI-Ā-TAU O TE RAUARA RANGAHAU HAUORA O TE AO KI ŌTĀKOU



Session 6		Infectious diseases II	Chair: Hallie Buckley
3:45	4:00	Arlene Ozanne, The effect of empowerment and self-determination on health outcomes	
4:00	4:15	Sameen Masood, Health consequences of work-life conflict: a qualitative investigation of the experiences of female academicians in Pakistan	
4:15	4:50	<b>Student presentations</b>	
		Raspati Koesoemadinata, Screening for latent and active tuberculosis in diabetes mellitus patients in Bandung, Indonesia: a prevalence study	
		Mohammad Momin, A formulation approach to improve aerosolisation of powders for inhalation to combat drug-resistant pulmonary infections	
		Tin Ohn Myat, High prevalence of ESBL- and carbapenemase-producing <i>Enterobacteriaceae</i> among patients sepsis in Yangon, Myanmar	
		Ayesha Verrall, Early Clearance of <i>Mycobacterium tuberculosis</i> infection	
		Michael Maze, Risk factors for acute leptospirosis in northern Tanzania: a prospective cohort study	
4:50	5:00	Student presentation prize and Closing	
5:00	6:00	<b>Free Time</b>	
6:00	7:00	ASID NZ Registration & Welcome drinks (OGHI Conference delegates welcome)	
7:00	8:00	<b>Keynote address: McKinlay Oration</b> <b>Prof Sarah Cleaveland OBE FRS FRSE</b> Professor of Comparative Epidemiology (Institute of Biodiversity Animal Health and Comparative Medicine), University of Glasgow, United Kingdom.  <i>Towards the global elimination of rabies: evidence, interventions and impact.</i> Venue: Dunedin Public Art Gallery All welcome	Chair John Crump

*\*\*denotes eligible for student prize*

Student Prize & Macandrew Bay School artwork kindly sponsored by



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## ABSTRACTS – IN ORDER OF PRESENTATIONS AND WHERE RECEIVED

### AN EVALUATION OF COMPLIANCE, KNOWLEDGE, AND ATTITUDES RELATED TO THE NEW 100% SMOKE-FREE LAW IN BARS AND RESTAURANTS IN KAMPALA, UGANDA

Shannon Gravely<sup>1</sup>; Kellen Namusisi Nyamurungi<sup>2</sup>; Steven Ndugwa Kabwama<sup>3</sup>; Lindsay Robertson<sup>4</sup>; Kelvin Khoo Chuan Heng<sup>5</sup>; Achiri Elvis Ndikum<sup>6</sup>; Adeniyi Oginni<sup>7</sup>; Jean Christophe Rusatira<sup>8</sup>; Socrates Kakoulides<sup>9</sup>.

<sup>1</sup> International Tobacco Control Policy Evaluation (ITC) Project, Department of Psychology, Waterloo Canada; <sup>2</sup> Centre for Tobacco Control in Africa (MakSPH-CTCA), Kampala, Uganda; <sup>3</sup> Public Health Fellowship Program, Field Epidemiology Track, Ministry of Health, Kampala, Uganda; <sup>4</sup> University of Otago, Dunedin, New Zealand; <sup>5</sup> World Health Organization, Beijing, China; <sup>6</sup> Association for the Promotion of Youth Leadership, Advocacy and Volunteerism (APYLAV), Yaounde, Cameroon.

<sup>7</sup> Nigerian Heart Foundation, Lagos, Nigeria; <sup>8</sup> Healthy People Rwanda, Kigali, Rwanda; <sup>9</sup> Mount Sinai St Luke's Hospital, New York City, USA

**Background:** In 2016, Uganda implemented the Tobacco Control Act 2015, which included a smoke-free (SF) law in public spaces. We assessed: (1) compliance with the SF law in bars and restaurants; and (2) knowledge and attitudes towards the SF law among venue staff. Methods: We conducted: (1) systematic observations of smoking behaviour and signage at bars and restaurants; and (2) structured interviews with employers and employees using a random sample of N=222 venues.

**Results:** Of the 222 establishments, 56.8% allowed smoking on the premises, 35.6% had a designated smoking area; indoor smoking was observed in 17.8% of venues. Only 30.8% had “no-smoking” signage, which largely did not meet regulations. Among the 222 interviewees, 28.8% believed they had been adequately informed about the SF law; however, 90% were in support of the law. 40.1% believed the SF law would negatively affect bars and restaurants’ business.

**Conclusions:** While most hospitality workers supported the SF law, many premises continued allowing smoking on-site, and most signage did not meet the new regulations. Civil society must play a key role in supporting compliance with the law, and a coordinated enforcement system must be

implemented to inform hospitality venues and smokers of the SF law requirements.

**Funding Sources:** The KOMPLY Smoke-Free Emerging Leaders Project is funded by the World Heart Federation. Additionally, SG is funded by the Canadian Cancer Society.

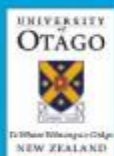
### STRUCTURAL TRANSFORMATION AND ECONOMIC DEVELOPMENT IN LOW-INCOME COUNTRIES: A RESEARCH AGENDA AND IMPLICATIONS OF IMPROVED HEALTH WORLDWIDE

Murat Üngör

Department of Economics, University of Otago, Dunedin. E-mail address: murat.ungor@otago.ac.nz

Why are some countries rich and others poor? This question and some related ones are among the most important in economic development. Economic development involves structural transformation, broadly described as systematic changes in the allocation of factors of production across sectors. Specifically, there is an association of economic development with a significant shift in the composition of economic activity, both in terms of employment and value added, away from agriculture and in favour of industry and services. Can differences in sectoral productivity growth rates account for the sectoral reallocation of labour in rich and poor countries? If the paths of sectoral productivity differ significantly across countries, then it is important to ask what factors are responsible for these differences. If the differences are more pronounced in particular sectors in particular countries, what are the factors that account for this? Is it policies that influence the diffusion of technology, or perhaps policies that generate misallocation of inputs across producers? Do genuine differences in health across countries account for the sectoral productivity differences between rich and poor countries? A variety of topics can be explored within context of structural transformation, including the links between health and sectoral productivity changes in low-income countries.





## DETERMINANTS OF MENSTRUAL HYGIENE PRACTICES AND HEALTH AMONGST ADOLESCENT GIRLS, GUJARAT, INDIA

Sneha Lakhotia

**Rationale:** Adolescents constitute one fifth of India's population and yet their sexual health needs remain largely unaddressed. Menstruation heralds the onset of transition to adulthood and is an inseparable part of every girl's life. The menstrual hygienic practices and management have been a less acknowledged problem even though it plays a pivotal role in the reproductive health of the adolescents.

**Methods:** A community based, mixed method study was done in a block of Vadodara District, Gujarat, India to determine the reproductive health amongst the adolescent girls by assessing their menstrual knowledge and hygiene practices.

**Results:** It was found that the adolescent girls had poor knowledge of menstruation and despite the availability of sanitary napkins, majority of the adolescent girls did not use for several. In addition, they had poor hygienic practices and there were many social restrictions imposed upon them. Education, social beliefs and environmental constraints came forward as important determinants.

**Conclusion:** The findings of the study will imply public health measures to be taken in order to promote healthy menstrual practices and reproductive health amongst the adolescent girls who are the key to nation building

## THE ROLE OF FAITH BASED ORGANIZATIONS IN PREVENTING AND RESPONDING TO SEXUAL, INTIMATE PARTNER AND GENDER-BASED VIOLENCE IN CONFLICT SETTINGS

Kate Magner<sup>1</sup>, Jennifer Desrosiers<sup>1</sup>, Isabella Blunt<sup>1</sup>, Tylah Hawken<sup>1</sup>

<sup>1</sup>University of Otago, Christchurch. In partnership with Medical Research Council South Africa and Sexual Violence Research Initiative.

**Background:** Sexual, intimate partner and gender-based violence (SGBV) causes significant morbidity and mortality in conflict settings. Faith based organisations (FBOs) often have access and influence in communities that few others have and may be uniquely positioned to respond to SGBV. There is a

need to better understand the nature of interventions involving FBOs, and the ways that FBOs can influence outcomes for survivors of SGBV in conflict settings.

**Methods:** A systematic search and Critical Interpretive Synthesis of qualitative and quantitative studies was conducted. Peer reviewed papers were included if they examined the role of FBOs in responding to sexual or gender-based violence in conflict settings.

**Results:** Six papers met the inclusion criteria and three key themes emerged. First, local and global partnerships were essential for effective, culturally competent and locally relevant service delivery. Second, varied and multi-faceted programs involving education, justice and health showed positive outcomes. Third, group based interventions were both a feasible and beneficial approach to addressing SGBV and have the additional advantage of fostering solidarity and community support.

**Conclusions:** More research in this area is needed. Questions remain regarding ways to negotiate effective partnerships with FBOs and strategies for managing the potentially divergent agendas of different partners.

## IN THE MEDIA EYE: MENTAL ILLNESS AND CARE IN FIJI

Jacqueline Leckie

Department of Anthropology and Archaeology, University of Otago

During the 1880s newspapers in Fiji shocked and fascinated readers with reports of Qaqa, a 'homicidal maniac' and Sukudaia, a crazy 'vagrant'. They became some of the first patients admitted to Fiji's lunatic asylum in 1884. The colonial order faced the problem of removing dangerous and difficult subjects from the community while treating them with a modicum of humanity, the latter being a mark of civilization, even if it was colonization that determined the new parameters and management of madness. Over a century later three media cases — Apete Kaisau's murder of John Scott and Gregory Scrivener, Sujit Kumar, known as the "Chicken Boy" and Nur Nisha, confined for years in a shed — evoked public outcry about the care of those with mental illness and disabilities in Fiji. What do these cases tell us about the meaning and management of mental illness, and the rights of the ill, and society? What duty do communities have to care for vulnerable members?





Answers remain complicated by the realities and nuances of economic and political development in a culturally complex society such as Fiji.

## GENETIC ANALYSES OF ANCIENT PATHOGENS IN THE PACIFIC - WHY WE CAN AND WHY WE SHOULD

Michael Knapp

Department of Anatomy, University of Otago, Dunedin, New Zealand

The study of ancient pathogens from human remains is as fascinating as it is essential for our understanding of past epidemics and human health through the centuries. However, ancient pathogens, such as *Yersinia pestis* (plague, Black Death) or *Mycobacterium tuberculosis* (tuberculosis), often do not leave unambiguous pathological lesions in the skeletal remains of their victims. Thus, it is not always straightforward to decide whether or not a long-dead individual was affected by a particular pathogen. For this reason, researchers have used ancient DNA techniques to search for genetic signatures of pathogens in human remains. However, despite the relevance of genetic investigations into ancient epidemics, major breakthroughs have been rare and the field has been subject to recurrent skepticism regarding the authenticity of results.

I will discuss technological advances that now allow us to confidently reconstruct genetic information from ancient pathogens and introduce our new project studying the antiquity and evolution of *M. tuberculosis* in New Zealand. The discussion will highlight the potential that studies of ancient pathogens have to contribute to our understanding of host/pathogen coevolution and the spread of infectious diseases around the globe.

## INTERNATIONAL STUDENTS' PSYCHOLOGICAL WELLBEING: FINDINGS FROM AN EXPLORATORY STUDY

Shyamala Nada-Raja

Department of Preventive & Social Medicine, University of Otago

**Background:** Recent New Zealand media reports have highlighted concerning mental health issues, including suicidality amongst international students. However, little is known about their mental wellbeing and links

with academic achievement. This presentation is based on findings from a large study on mental wellbeing in a sample of Otago University students to inform developing relevant interventions for wellbeing.

**Methods:** This cohort study comprising three different cohorts from 2012 to 2014 was conducted via a study website ([www.owius.org](http://www.owius.org)). Standardised measures were used to assess mental wellbeing and risk (e.g., alcohol use) and protective factors (e.g., social connectedness).

**Results:** In this presentation key findings on mental wellbeing between international (n = 55, 7%) and New Zealand students (n = 735, 93%) will be compared. Poor mental wellbeing was slightly more likely to be reported by international students (38%) than New Zealand students (33%). **Conclusions:** With more than a third of international students reporting poor wellbeing, effective pastoral care at tertiary institutions will be critical for promoting their mental well-being, academic retention, and achievement. A better understanding of international students' mental wellbeing is necessary to ensure effective pastoral care and relevant policies for these students at our tertiary institutions in a globalized economy.

## THE STATE OF SUICIDE RESEARCH IN LOW-INCOME COUNTRIES: A SYSTEMATIC REVIEW

Daniel D.L. Coppersmith

Department of Preventive & Social Medicine, University of Otago

**Background:** Approximately 804,000 people die by suicide every year and the World Health Organization estimates that 75% occur in low and middle income countries. This systematic review summarises suicide research in low-income countries (LICS) to help guide future research and prevention efforts.

**Methods:** The study protocol was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). PubMed and PsychInfo databases were used to select articles from 1998 to 2013 for the review. Articles were included if some form of suicidal behavior was measured (e.g. suicide attempt) and coded for descriptive information (e.g. study design).

**Results:** 851 abstracts were screened and 83 articles were included in the final review. Most low-income





countries (56%) published no suicide research measuring suicidal behaviors, but the number of articles published per year is increasing. Most studies were epidemiological, focused on young people, and examined stressful life events as the most common risk factor for suicidal behaviors.

**Conclusions:** Given previous research on significant cross-national variations in the prevalence of suicidal behavior and the necessity for culturally adapted evidence-based interventions, further research is required on suicidal behaviors in LICs. Findings will be discussed in relation to those from high-income countries.

#### PRIORITY-SETTING AS A PRIORITY IN GLOBAL HEALTH

Saeideh Babashahi

Department of Economics, School of Business, University of Otago,  
Dunedin, New Zealand

Global Health includes studying ways to improve overall health status and reduce health inequities. Towards these ends, it is necessary to set priorities due to competing demands for scarce resources. Resources should be effectively allocated across different areas – e.g. ranging from preventive to curative services, infrastructure and research at various levels in the health sector. Priority-setting has drawn increasing amounts of attention from researchers and policy-makers over the past few years. This paper reports on a narrative review of studies focussed on priority-setting methods based on Multiple Criteria Decision Analysis (MCDA). MCDA is used for complex decision-making that involves choosing between competing alternatives – e.g. health technologies or patients – when faced with conflicting objectives or criteria and a budget constraint. Ample evidence exists of MCDA's practicality and reliability for supporting priority-setting in a wide variety of health applications. As all main stakeholders' views can be reflected in MCDA processes, the resulting decisions are likely to be more acceptable than alternative methods. Ultimately, MCDA can be expected to result in more effective priority-setting, contributing to improvements in overall health status and reductions in health inequities.

#### A PILOT SURVEY ON ACCESS TO SURGICAL CARE IN VANUATU

Noah Bunkley, Will Perry, Basil Leodoro, Anna Dare, Ian Bissett

University of Auckland

**Background:** Surgical care is an important part of a robust healthcare system, yet there is a paucity of data about the burden, capacity and access to surgical services in many Pacific Island countries. Vanuatu, in the Western Pacific, faces challenges in the delivery of surgical services. This pilot study aims to geographically map the distribution and determinants of surgical access in Efate, and determine whether this can be scaled up to include Vanuatu as a whole.

**Methods:** 150 rural and 150 urban households were randomly selected from Efate from the 2009 census. A questionnaire was developed based on a literature review and a modified Delphi approach. The questionnaire was administered by local health workers and data was collected electronically. Principal component analysis, GIS analysis and standard statistical analysis is currently being undertaken.

**Results:** Questionnaires were completed by 284 households out of a total 300. Analysis of the responses is currently being undertaken.

**Conclusion:** Initial analysis looks promising for identifying the barriers to surgical care access for Vanuatu. These results will provide information on the level of access in Vanuatu. Identifying the specific areas with poor access and the reasons for lack of access can lead to the development of more targeted interventions.

#### MULTIPLE MICRONUTRIENT DEFICIENCIES AMONG YOUNG INDIAN CHILDREN AGED 12-24 MONTHS LIVING IN THE SLUMS OF NEW DELHI

Deborah McIntosh<sup>1</sup>, Geeta Trilok-Kumar<sup>2</sup>, Michelle J Harper<sup>1</sup>, Malcolm Reid<sup>3</sup>, David Barr<sup>3</sup>, Karl B Bailey<sup>1</sup>, Juergen G Erhardt<sup>4</sup>, Rosalind S Gibson<sup>1</sup>, Lisa A Houghton<sup>1</sup>

<sup>1</sup>Department of Human Nutrition, University of Otago, Dunedin, New Zealand; <sup>2</sup>Biochemistry, Institute of Home Economics, University of Delhi, New Delhi, India; <sup>3</sup>Department of Chemistry, University of Otago, Dunedin, New Zealand; <sup>4</sup>VitMin Lab, Germany





**Background:** Micronutrient deficiencies continue to be a worldwide public health concern with many South Asian countries including India suffering a significant proportion of the global burden. Nonetheless, lack of data among young children has hindered sustained action to address the problem. In this cross-sectional study, we assessed the prevalence of anaemia, as well as deficiencies of iron, zinc, selenium, vitamins A, B12, and D among children aged 12-24 months from a slum area in south Delhi.

**Methods:** Non-fasting morning venipuncture blood samples were analyzed for haemoglobin, serum retinol binding protein (RBP), ferritin, transferrin receptor, zinc, selenium, 25-hydroxyvitamin D, and vitamin B12.

**Results:** Anaemia had the highest prevalence (79%) (haemoglobin <110 g/L) followed by deficiencies of vitamins D (74%) (25(OH)D <50 nmol/L), B12 (29%; <220 pmol/L) and zinc (23%; <9.9 µmol/L). Of the anaemic children, 84% (51 of 61) had iron deficiency anaemia, and 7% (4 of 61) had depleted iron stores. Prevalence of deficiencies of vitamin A (3%) and selenium (2%) was very low. Among the children, 61% had both low haemoglobin and vitamin D, 18% had low haemoglobin and zinc, and 13% had all three micronutrient deficiencies.

**Conclusion:** Co-existing multiple micronutrient deficiencies are a severe public health problem among these young Indian children, and intervention strategies are needed.

**Funding** provided by the University Grants Commission, New Zealand-India Education Council and Otago University Research Grant.

#### RELATIONSHIP BETWEEN WHO INFANT AND YOUNG CHILD FEEDING (IYCF) INDICATORS, NUTRIENT ADEQUACY AND GROWTH IN INFANTS AGED 6, 9, AND 12 MONTHS FROM SUMEDANG DISTRICT, WEST JAVA PROVINCE, INDONESIA

Aly Diana<sup>1,2</sup>, Simonette R Mallard<sup>2</sup>, Jill Hazard<sup>2</sup>, Dwi M Purnamasari<sup>1</sup>, Ikrimah Nurulazmi<sup>1</sup>, Pratami D Herliani<sup>1</sup>, Gaga I Nugraha<sup>1</sup>, Rosalind S Gibson<sup>2</sup>, and Lisa Houghton<sup>2</sup>

<sup>1</sup>Faculty of Medicine, Universitas Padjadjaran, West Java, Indonesia and <sup>2</sup>Department of Human Nutrition, University of Otago, Otago, New Zealand

**Background:** Stunting and underweight among under-five children in Indonesia are high raising public health concerns. Inappropriate complementary feeding from 6-23 months may compromise optimal growth. We investigated the relationship between WHO IYCF indicators, nutrient adequacy, and infant growth.

**Methods:** In Sumedang district, West Java, Indonesia, we enrolled breastfed infants at 6 months (n=228); and followed them at 9 (n=202) and 12 months (n=190). We collected socio-demographic data, anthropometry and two-day in-home weighed food records and explored relationships using multiple linear regression.

**Results:** Stunting and underweight increased from 15.8% and 4.4% at 6 months to 22.6% and 10.5% at 12 months, respectively. Median intakes of energy, niacin, iron, and zinc were lower than estimated needs from complementary foods. Positive relationships existed between animal protein ( $\beta = 0.30$ ; 95% CI: 0.03, 0.58;  $P = 0.03$ ), iron/zinc-fortified infant products ( $\beta = 0.27$ ; 95% CI: 0.08, 0.46;  $P = 0.01$ ) at 9 months and LAZ at 12 months, and dairy products and WAZ ( $\beta = 0.13$ ; 95% CI: 0.02, 0.24;  $P = 0.02$ ) at 12 months.

**Conclusions:** Low intakes of animal protein and dairy products were associated with poor growth. Improved IYCF practices are needed to ensure energy and nutrient needs are met.

**Funding body:** Meat and Livestock Australia and Otago University Research Grant

#### HEALTH CARE FOR ELDERS IN RURAL SOUTHERN CHINA -AN INTEGRATED BIOETHICAL AND ANTHROPOLOGICAL STUDY

Xiang Zou

Bioethics Centre, University of Otago, Dunedin. Email xiang.zou@postgrad.otago.ac.nz

Nowadays China is undergoing a rapid population aging with tremendous pressure for providing eldercare. The problem of rural elders' health care is singularly prominent due to elders' high health demands on the one hand and inadequate supports under rural-urban health disparities on the other. Different from relying on social institutions for eldercare in the developed world, caring elders in China has been long heavily relying on families, especially in rural areas. Yet current China's social





economic realities and rural-urban migration trend have undermined family's role in caregiving and its resources to support elders with quality health care. Previous studies on health care in China have mainly focused upon eldercare institutions in affluent urban settings. This study will locate elderly health care in low-resource rural settings, using a micro lens to unfold how health care is practiced and intersected with family care. Using qualitative anthropological methods, it will investigate how Chinese families, as the caregiving agent, practice care for elders with high medical demands in a village clinic in Southern China. As a bioethical study, normative analysis will be developed to appeal to the state for more affordable and accessible healthcare services and social supports for elderly people in rural China.

#### **GROWTH AND DEVELOPMENT DURING THE AGRICULTURAL TRANSITION IN PRE-HISPANIC NORTHERN CHILE**

Gail Elliott<sup>1</sup>, Siân Halcrow<sup>1</sup>, Hallie Buckley<sup>1</sup>, Vivien Standen<sup>2</sup>, and Bernardo Arriaza<sup>3</sup>

<sup>1</sup>Department of Anatomy, University of Otago, New Zealand;

<sup>2</sup>Departamento de Antropología, Universidad de Tarapacá, Chile;

<sup>3</sup>Instituto de Alta Investigación, Universidad de Tarapacá, Chile.

The bioarchaeological model of health change posits a deterioration in health with the development of agriculture. This model is based predominantly on findings from North America and European populations, reporting that with the intensification of agriculture there was a deterioration of health due to the increase in population sizes, unsanitary conditions, and the spread of diseases due to close living conditions and proximity to domesticated animals. Greater dependence on plant carbohydrates may have also resulted in nutrient deficiencies, making populations more susceptible to disease and infection. However, some recent work in South America and Asia is challenging this model, suggesting that region-specific factors may influence physiological stress levels. To test this model of deteriorating health this paper presents an assessment of growth disruption as an indicator for physiological stress in prehistoric infants and children from the Azapa, Camarones, and Lluta coastal valleys of northern Chile. This skeletal sample is perfectly placed to test the model for health

using growth because it contains high numbers of well-preserved infants and children (N=246), representing well-documented pre- and post-agricultural cultures (ca. 10,000 to 500 B.P.). Dental crown size did not decrease and crown size asymmetry did not significantly increase across the agricultural transition. This finding suggests that health was not adversely affected by the adoption of agriculture in the region, possibly because populations continued to heavily supplement agricultural carbohydrates with marine and terrestrial resources.

#### **NEOLITHIC HEALTH: AN ASSESSMENT OF ANIMAL-HUMAN INTERACTION IN PREHISTORIC VIETNAM**

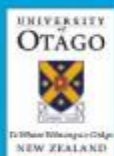
Lenette Breytenbach<sup>1</sup>, Hallie Buckley<sup>1</sup>, Marc Oxenham<sup>2</sup>

<sup>1</sup> Department of Anatomy, University of Otago; <sup>2</sup> The Australian National University.

The aim of this research is to assess the level of human-animal interaction at the neolithic Con Co Ngua burial site in Northern Vietnam and its possible affect on human health in the region through palaeopathological analysis of human skeletal remains. Five burials have been identified across the site with an unusual distribution of lytic lesions as well as a calcified cyst. Through differential diagnosis and the employment of imaging techniques, the paleopathological conditions of Neolithic Vietnam will be explored to determine what caused these lesions. The diseases I will be investigating as possible causes of these lesions are Echinococcosis, Tuberculosis, Osteological cancers and non-specific infection such as Osteomyelitis. Initial results are indicative of an Echinococcosis diagnosis.

This research will allow a greater understanding of the way in which infectious disease took hold in the changing landscape of Neolithic Vietnam, which is of particular relevance in today's society as





## IMPACT AND EFFECTIVENESS OF PNEUMOCOCCAL VACCINATION ON CHILDHOOD PNEUMONIA IN THE GAMBIA

Grant A Mackenzie, Philip C Hill, Shah M Sahito, David J Jeffries, Stephen R Howie, Richard A Adegbola, Prof Brian M Greenwood, Prof Tumani Corrah, and the PSP surveillance study group.

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London School of Hygiene and Tropical Medicine, Keppel St, London, WC1E 7HT, UK;  
Centre for International Health, University of Otago, Leith St, Dunedin, New Zealand;  
Department of Paediatrics: Child and Youth Health, University of Auckland, Victoria St West, Auckland, New Zealand  
GlaxoSmithKline, Vaccines, Ave Fleming, Wavre, Belgium.

**Importance:** Pneumococcal conjugate vaccines (PCV) have been introduced into many low-income countries but impact data on pneumonia are limited.

**Objective:** To measure the impact and effectiveness of infant immunization with PCV on pneumonia.

**Design:** Population-based standardised surveillance and case-control study for pneumonia within a demographic surveillance system (HDSS). Radiographs were evaluated using the WHO-standard for pneumonia.

**Setting:** Health facilities in Basse and Fuladu West HDSSs in rural Gambia.

**Participants:** Residents aged 2–59 months and age-matched community controls.

**Intervention:** 7-valent PCV was introduced in August 2009 followed by PCV13 in May 2011.

**Main Outcomes:** Incidence of radiologic pneumonia in baseline and PCV13 periods. Secondary outcomes were vaccine-type, non-vaccine type, and pneumococcal pneumonia. Incidence was corrected for changes in surveillance sensitivity over time. Vaccine effectiveness was determined by case-control study.

**Results:** We investigated 15 493 patients and identified 1672 cases of radiologic pneumonia. The impact of PCV against the primary and secondary pneumonia outcomes is currently being analysed and will be presented at the conference. The effectiveness, as estimated by case control study, against radiological pneumonia will also be presented.

**Conclusions:** The Gambian PCV surveillance system and case control study provided robust estimates of PCV impact and effectiveness against pneumonia. Low-income countries that introduce PCV13 with reasonable coverage can expect similar impact reductions against childhood pneumonia.

## TRENDS IN NASOPHARYNGEAL PNEUMOCOCCAL CARRIAGE SEROTYPES FIVE YEARS AFTER PCV13 INTRODUCTION IN THE GAMBIA

Effua Usuf <sup>1</sup>, Christian Bottomley <sup>2</sup>, Isatou Jagne <sup>1</sup>, Abdoulie Bojang <sup>1</sup>, Ousman Secka <sup>1</sup>, Beate Kampmann <sup>3</sup>, Philip Hill <sup>4</sup>, Anna Roca <sup>1</sup>

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**Background:** The Gambia switched to PCV13 in 2011 two years after PCV7 was introduced into the national immunisation programme. We assessed the impact of routine PCV13 on pneumococcal serotypes in a periurban setting of the Gambia.

**Methods:** We conducted three cross sectional surveys (CSS): (i) CSS1 before PCV13 introduction, (ii) CSS2 one year and, (iii) CSS3 five years after PCV13 introduction. Nasopharyngeal swabs were collected from healthy infants who had received three doses of PCV [PCV7 in CSS1 and PCV13 in CSS 2&3] and their mothers. Pneumococci were isolated and serotyped using conventional microbiology methods.

**Results:** Among infants, PCV13 vaccine serotypes (VT) decreased from 33.3% at CSS1 to 11.1% at CSS3 [P <0.001] while NVT increased from 53.1% to 74.6% [p <0.001]. Overall pneumococcal carriage remained stable.

Among mothers, overall and NVT carriage increased between CSS1 and CSS3. There was a weak indication of VT decrease between CSS2 and CSS3, from 8.4% to 5.6%, p=0.062.

In both age groups, serotype 6A had disappeared and 19A decreased significantly. Non-typeable serotypes increased in both CSS2 and CSS3.

**Conclusions:** There has been a significant redistribution of nasopharyngeal pneumococcal serotypes in the Gambia. We begin to see some herd effect among mothers at CSS3.





## FEASIBILITY STUDY OF ACTIVE CASE FINDING APPROACHES FOR TUBERCULOSIS IN BANDUNG CITY, INDONESIA

Sue McAllister<sup>1</sup>, Bony Wiem Lestari<sup>2</sup>, Budi Sujatmiko<sup>2</sup>,  
Nury Fitria Dewi<sup>2</sup>, Dini Fathania<sup>2</sup>, Raspati C.  
Koesoemadinata<sup>2</sup>, Philip C. Hill<sup>1</sup>, Bacti Alisjahbana<sup>2</sup>

<sup>1</sup> Centre for International Health, University of Otago, Dunedin, New Zealand; <sup>2</sup> TB-HIV Research Centre, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia

**Background:** Estimates show there is likely to be a large number of undiagnosed tuberculosis (TB) cases in TB- endemic countries. Our study evaluated the feasibility of using Community Health Workers (CHWs) in detecting active TB cases in Bandung, Indonesia.

**Methods:** CHWs visited households in randomly selected 'neighbourhoods' in one Primary Health Centre's catchment area, screened household members for cough, and collected sputum on symptomatic individuals. Household contacts of previously diagnosed TB cases and individuals in their neighbouring households were similarly screened. The yield of symptomatic, and confirmed TB, cases from each approach was compared.

**Results:** In 'neighbourhoods', 5100 individuals were screened, 48 (0.9%) reported cough, 38 provided a sputum specimen. From 25 Index cases, 66 household contacts and 312 neighbours were screened: 1 (1.5%) and 2 (0.6%), respectively, had symptoms and sputum collected. No positive TB cases were detected. The incidence of a TB diagnosis within 2014-2015 was 325, 866, and 733 cases per/year/100,000 population in 'neighbourhoods', index, and neighbouring households, respectively. Through regular supervision CHWs were competent at case finding. There was acceptance by community stakeholders although some suggestion of embarrassment at reporting symptoms.

**Conclusion:** Low reporting of TB symptoms suggests a more sensitive screening test, such as chest x-ray, and greater emphasis on high-risk groups may be more effective on an ongoing basis.

## THE LAST MALARIA PARASITE STANDING: CHALLENGES IN ELIMINATING 'RELAPSING MALARIA'

Bruce Russell<sup>1</sup>

<sup>1</sup> Department of Microbiology and Immunology, University of Otago, Dunedin, Otago, NZ

In the aftermath of the highly touted global malaria elimination strategy, one parasite species threatens to remain defiant. The parasite, *Plasmodium vivax*, is the most widely distributed and difficult to treat cause of malaria. Recent mass drug administration campaigns focused on eliminating artemisinin resistant *P. falciparum* have done little to impact on the burden of vivax malaria, with new data also indicating a disturbing level of asymptomatic and sub patent *P. vivax* infections. Here I will present the central challenges facing the control of vivax malaria as well as new research on the biology of *P. vivax* (focusing on a range of novel *ex vivo* and clinical studies from the Thai / Myanmar Border) that may provide a better and more realistic path to its elimination.

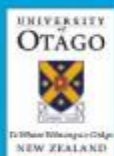
## THE ANTIQUITY OF TREPONEMAL DISEASE IN SEASIA AND THE PACIFIC: PALAEOPATHOLOGY RESEARCH ON THE DISEASE AND IMPLICATIONS FOR SETTLEMENT HISTORY AND MODERN HEALTH

Hallie Buckley and Sigrid Labidon

Department of Anatomy, University of Otago

Kirch (2000) suggested that the impact of infectious disease on human populations during the prehistory of the Pacific Islands has received less attention than other regions of the world. By analysing markers for disease in human skeletal remains this paper will to address the role of infectious disease during the human settlement in SEAsia and the Pacific Islands and its effect on human health. Yaws (*Tr. pertenue*) has a reasonably short history in the region and is highly visible in the skeletal record. Here we present an extensive review of published accounts of this disease in the wider region. No pre-European contact cases of treponemal disease have been reported in MSEA or island SEAsia (ISEA). There are also no cases of Lapita treponemal disease in the SW Pacific or pre-Latte Micronesian samples. ISEA provides a potential waystation for the introduction of the disease into the Pacific. There is a significant gap in published health oriented bioarchaeological research in this region. If the earliest evidence of the disease in the Pacific islands is from Micronesia c. 800 CE,





What was the route of its entry and when did this occur? Possible answers to this question this are discussed in this presentation.

#### UNIVERSITY OF OTAGO ENGAGEMENT IN THE PACIFIC

Faumuina Faafetai Sopoaga

Associate Dean (Pacific), Division of Health Sciences

The University has a strong commitment to Pacific developments as outlined in the University of Otago (UoO) Pacific Strategic Framework (PSF) (2013-2020). The Pacific Strategic Framework has 6 Goals that focus on six areas:

1. Leadership on Pacific matters
2. Pacific Research Excellence
3. Community Engagement
4. Growth and Development
5. Pacific Curricula
6. Pacific Regional and International Progress

As part of its commitment, the University has MoUs with a number of Pacific countries exploring how we can best work together. This presentation will highlight key developments in UoO's relationship with a number of Pacific countries, discuss challenges and outline opportunities for strengthening relationships and growing our collaborative work together.

#### A GLOBAL HEALTH CLASSROOM (GHC) - COLLABORATIVE CASE-BASED SMALL-GROUP LEARNING ACTIVITIES BETWEEN MEDICAL STUDENT AT PAHS MEDICAL SCHOOL, NEPAL AND UOC, NEW ZEALAND – A PILOT STUDY UTILISING INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

Andrew P Miller<sup>1</sup>, Ashis Shrestha<sup>2</sup>, David R Murdoch<sup>1</sup>, Jen Desrosiers<sup>1</sup>

<sup>1</sup> University of Otago Christchurch (UOC), Christchurch New Zealand;

<sup>2</sup> Patan Academy of Health Sciences (PAHS) Kathmandu, Nepal

**Background:** At both OMS and PAHS Medical School, much medical student learning involves small group case-based work. In 2016, PAHS and UOC did a pilot study of collaborative small-group, case-based tutorials between senior medical student groups utilizing ICT to link the groups at PAHS and UOC. The founding principles were of partnership, reciprocity and mutual benefit for both schools. A major aim was to enhance global health learning at both schools.

**Methods:** Senior medical students at PAHS have a six month placement at one of four small hospital/clinics, during which they have a series of weekly tutorials on key common medical conditions/presentations. Three of these tutorials were chosen to pilot collaborative case-based learning between groups at PAHS and a student group at UOC. Several formats and ICT platforms were utilised.

**Results:** The pilot study was successful overall, with agreement to continue these sessions in 2017. Key factors for the overall success of the sessions were determined. The case-based format seems to have much potential for global health learning and more emphasis on this is planned for the 2017 sessions.

**Conclusions:** Collaborative case-based learning between medical students in Nepal and NZ, utilising ICT was mutually beneficial, and showed

#### RETHINKING THE ROLE OF DATA IN ALLOCATING GLOBAL HEALTH AID

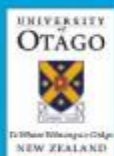
Kristin Voigt<sup>1,2</sup>

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In light of changes in the global disease burden, some researchers have called for a reallocation of global health aid from communicable diseases towards a broader agenda that places greater emphasis on non-communicable diseases.

Focusing on how this debate uses global health data, this paper highlights two concerns: First, much of the debate assumes that information about the global disease burden, and the contribution individual diseases (or disease groups) make to this burden, can *by itself* provide conclusions about how aid ought to be allocated. This, however, fails to appreciate the limitations of empirical data when it comes to resource allocation and priority-setting decisions, and obscures the need for explicit debate about the normative dimension of such decisions. Second, there has been little debate about how to make global health data useful for allocation decisions. In particular, reliance on the traditional distinction between communicable diseases, non-communicable diseases and injuries obscures issues that must play a central role in allocation decisions. While the





increasing amount of data specifying developments in global health offers valuable opportunities, the onus is on global health researchers to consider how this data can be made useful for decisions about priorities in global health.

### THE BANDUNG NEUROSURGERY PATIENT OUTCOMES PROJECT, INDONESIA

Agung Budi Sutiono<sup>1</sup>, Ahmad Faried<sup>1</sup>, Sue McAllister<sup>2</sup>,  
Amelia Ganefianty<sup>1</sup>, Kalih Sarjono<sup>1</sup>, Muhammad  
Zafrullah Arifin<sup>1</sup>, Sarah Derrett<sup>3</sup>

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<sup>2</sup> Centre for International Health, Department of Preventive and Social Medicine, University of Otago, Dunedin, New Zealand

<sup>3</sup> Injury Prevention Research Unit, Department of Preventive and Social Medicine, University of Otago, Dunedin, New Zealand

**Background:** Follow-up of neurosurgery patients following hospital discharge is important yet little is known about this in low- and middle-income countries. Our study describes the characteristics, health-care pathways, and health-related quality of life of patients admitted to the Neurosurgery Department in Bandung, Indonesia and the feasibility of follow-up by telephone post-discharge.

**Methods:** Eligible patients were aged  $\geq 18$  years. Clinical data was collected on admission. An in-person interview was held 1-2 days pre-discharge and telephone interviews one, two, and three months later. Socio-demographic, Glasgow Coma Scale (GCS), EQ-5D-5L, and health service utilization data were collected. Contact attempts for each follow-up interview were documented, and overall acceptability of undertaking interviews.

**Results:** Of 217 patients admitted, 37 died; pre-discharge interviews were undertaken with 178. Twelve patients died post-discharge; 95% were followed-up to three months. Mean age was 41 years. GCS on admission: 63% mild, 31% moderate, 3% severe. Causes of admission were injury (48%) and illness (52%). Prior to discharge, only one-third (or less) reported 'no problems' in the EQ-5D dimensions of mobility (32%), self-care (27%), usual activities (16%), pain/discomfort (32%); 70% reported 'no problems' with anxiety/depression. By one-month, 84% had attended a follow-up consultation with a health professional – mostly with a neurosurgeon.

**Conclusion:** A large proportion of patients are discharged with considerable levels of difficulty in four of the five EQ-5D dimensions. This stresses the importance of providing good follow-up and support of patients and their families and this is indeed feasible and appreciated by patients.

### USING THE EQ-5D-5L TO ASSESS HEALTH-RELATED QUALITY OF LIFE – WHAT DOES IT TELL US? EXAMPLES FROM TWO STUDIES IN BANDUNG, INDONESIA

Sue McAllister<sup>1</sup>

#### TANDEM study

Sofia Imaculata<sup>2</sup>, Yoko Laurence<sup>3</sup>, Sarah Kerry<sup>4</sup>, Julia Critchley<sup>4</sup>, Reinout van Crevel<sup>5</sup>, Philip Hill<sup>1</sup>, Rovina Ruslami<sup>2</sup>, Bachti Alisjahbana<sup>2</sup>

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#### Neurotrauma study

Ahmad Faried<sup>6</sup>, Agung Budi Sutiono<sup>6</sup>, Amelia Ganefianty<sup>6</sup>, Kalih Sarjono<sup>6</sup>, Muhammad Zafrullah Arifin<sup>6</sup>, Ari Samaranayaka<sup>7</sup>, Sarah Derrett<sup>7</sup>

<sup>6</sup> Department of Neurosurgery, Faculty of Medicine, Universitas Padjadjaran – Dr. Hasan Sadikin Hospital, Bandung, Indonesia;

<sup>7</sup> Injury Prevention Research Unit, Department of Preventive and Social Medicine, University of Otago, Dunedin, New Zealand

**Background:** The EQ-5D-5L is a generic health-related quality of life (HRQOL) measure widely used across many countries, diseases and injury types, but less so in low- and middle-income countries such as Indonesia. This abstract reports results from two different patient groups (tuberculosis (TB) and neuro-trauma) in Bandung, Indonesia to show how this tool can be used in research and clinical appraisal of patients HRQOL.

**Methods:** As part of the TANDEM program, we conducted a cross-sectional study of newly diagnosed TB patients aged  $\geq 18$  years. The EQ-5D-5L was administered by interview at the time of diagnosis. Eligible neurotrauma patients were aged  $\geq 18$  years admitted to the Neurosurgery Department, Hasan Sadikin Hospital. The EQ-5D-5L was administered in-





person 1-2 days pre-discharge, and by telephone interview 1, 2 and 3 months post-discharge.

**Results:** Of the 850 TB patients (mean age 41; 57% male), the proportion reporting 'any problems' in the EQ-5D-5L was highest for pain/discomfort (77%), followed by anxiety/depression (65%), usual activities (56%), mobility (39%), self-care (18%).

Of the 178 neuro-trauma patients (mean age 41; 61% male), the proportion reporting 'any problems' pre-discharge in the EQ-5D-5L was highest for usual activities (84%), followed by self-care (73%), mobility (68%), pain/discomfort (68%), anxiety/depression (30%). These proportions decreased considerably over 3 months follow-up but there was still a substantial proportion reporting extreme problems in mobility, self-care and usual activities.

**Conclusion:** The EQ-5D-5L can provide clinicians and researchers with insights into patients' HRQOL and level of burden being experienced that may be amenable to intervention.

#### TRACING HUMAN LEPTOSPIROSIS BACK TO INFECTING ANIMAL SPECIES – EVIDENCE FROM NEW ZEALAND, FIJI AND NEPAL

Cord Heuer<sup>1</sup>, Jackie Benschop<sup>2</sup>, Emilie Vallee<sup>1</sup>, Julie E Collins-Emerson<sup>2</sup>, Anou Dreyfus<sup>3</sup>, Colleen L Lau<sup>4</sup>, Eri Togami E<sup>5</sup>, Milan Gautam<sup>1</sup>, Juan Sanhueza<sup>1</sup>, David Wilkinson<sup>2</sup>, Peter R Wilson<sup>1</sup>

<sup>1</sup>EpiCentre and <sup>2</sup>mEpiLab, Massey University, Palmerston North, New Zealand; <sup>3</sup>Faculty of Veterinary Medicine, Zurich, Switzerland; <sup>4</sup>Queensland University, Brisbane, Australia; <sup>5</sup>Yale University, New Haven CT/USA

**Background:** Human leptospirosis is caused by exposure to domestic livestock, rodents or other wildlife species. This presentation summarises methodology and findings of source attribution studies in New Zealand, Fiji and Nepal with different eco-climatic environments and high endemic levels of human leptospirosis.

**Methods:** In New Zealand, abattoir workers, farmers and veterinarians were tested serologically and interviewed for preceding exposure and flu-like signs of illness. Febrile patients in Nepal were tested for 20 serovars and re-tested at home to ascertain clinical leptospirosis along with in-contact domestic animals. A cross sectional study in Fiji tested humans, 5

domestic animal and 2 rodent species sharing the same household.

**Results:** Sero-conversion (11%) of abattoir workers in New Zealand was higher at the front end of the slaughter board. Farmers were exposed to the wildlife serovar Ballum whereas abattoir workers and veterinarians were seropositive for serovars of domestic animals. Febrile patients in Nepal acquired infections from domestic ruminants but not rodents dogs or cats. In Fiji, rodents and dogs, but not pigs, were likely reservoirs for human infections.

**Conclusions:** A rational epidemiological survey design with appropriate methods for selecting the source population, pathogen typing and data analysis can reveal specific transmission pattern which are essential prerequisites for strategic interventions to control clinical leptospirosis in humans.

#### ASSOCIATION OF ZONOTIC, OCCUPATIONAL AND ENVIRONMENTAL RISK FACTORS WITH CLINICAL LEPTOSPIROSIS AMONGST FEVER PATIENTS IN KASKI DISTRICT, NEPAL

Rupesh Shrestha<sup>1</sup>, Joanna S. McKenzie<sup>2</sup>, Cord Heuer<sup>1</sup>, Milan Gautam<sup>3</sup>, Ramesh Prasad Adhikary<sup>4</sup>, Pragya Koirala<sup>5</sup>, Gyan Bahadur BC<sup>6</sup>, Kedar Raj Pandey<sup>7</sup>, Julie Collins-Emerson<sup>8</sup>, Scott Craig<sup>9</sup>, Jackie Benschop<sup>8</sup>, Laurie Miller<sup>10</sup>

<sup>1</sup>EpiCentre, IVABS, Massey University, Palmerston North;

<sup>2</sup>International Development Group, IVABS, Massey University, Palmerston North; <sup>3</sup>Child Health and Environment Save Society, Pokhara; <sup>4</sup>Kaski District Public Health Office, Ministry of Health and Population, Nepal; <sup>5</sup>Central Veterinary Laboratory, Ministry of Agricultural Development, Nepal; <sup>6</sup>Department of Health Services, Ministry of Health and Population, Nepal; <sup>7</sup>Pokhara Regional Veterinary Laboratory, Ministry of Agricultural Development; <sup>8</sup>mEpiLab, IVABS, Massey University, Palmerston North; <sup>9</sup>WHO/OIE Collaborating Centre for Reference and Research on Leptospirosis in Brisbane, Australia; <sup>10</sup>School of Medicine, Tufts University, USA

A one health case control study assessed zoonotic, environmental and occupational risk factors associated with 13 clinical leptospirosis cases identified from 239 fever patients in Kaski District, Nepal recruited during April-September 2013. A feature of the study is inclusion of data on the leptospirosis serological status of livestock, pets and rodents in study participants' households. Microagglutination testing (MAT) of paired human serum samples with a panel of 20 serovars showed an





incidence of 5.4% acute clinical leptospirosis cases amongst the fever patients. No distinguishing clinical symptoms were positively associated with clinical leptospirosis cases. Owning goats was the most significant animal-related factor, increasing the risk of leptospirosis in owners by 3 to 5 times respectively for MAT-negative and MAT-positive goats, compared with not owning goats. Males were 5 times more likely to be a leptospirosis case than females and working in rice fields also significantly increased the risk of clinical leptospirosis. The leptospira serovars identified in humans were most similar to those identified in ruminants and least similar with those in rodents. The results suggest ruminants are a more important source of leptospirosis than rodents in this study population

#### ENVIRONMENTAL AND DEMOGRAPHIC RISK FACTORS FOR SCRUB TYPHUS IN BHUTAN

Tandin Zangpo<sup>1</sup>, Yoenten Phuentshok<sup>1</sup>, Kezang Dorji<sup>1</sup>, Sithar Dorjee<sup>1</sup>, Joanna S. McKenzie<sup>2</sup>, Roger S. Morris<sup>2</sup> and Peter D. Jolly<sup>2</sup>

<sup>1</sup>Khesar Gyalpo University of Medical Sciences of Bhutan, Thimphu, Bhutan; <sup>2</sup>Institute of Veterinary Animal and Biomedical Sciences, Massey University, Palmerston North, New Zealand.

Scrub typhus is an emerging zoonotic disease first detected in Bhutan in 2008, with an increasing annual incidence significantly impacting human health. We conducted a case-control study, recruiting 150 cases and 300 controls from 11 districts mainly located in southern Bhutan during October-December 2015. For each case, one control was matched by village/location and a second was randomly selected from people visiting the same hospital. Data on environmental exposures in the previous one month and demographic factors were collected by interview using a standard questionnaire. No significant differences in age or socio-economic factors were evident between cases and controls. The major risk factors identified for the clinical cases of scrub typhus were harvesting cardamom (OR 60.7,  $P=0.003$ ) and having an outside toilet (OR 11.9,  $P<0.001$ ). A small sample of rodents in the study area were seropositive for *Leptospira interrogans*, *Anaplasma phagocytophilum*, and *Bartonella* spp. Findings will be used to make recommendations to the Department of

Public Health regarding cost-effective scrub typhus control and prevention measures. Outcomes will also contribute to design of future inter-disciplinary studies investigating risk factors for pathogen transmission from wildlife reservoirs and vector species to humans.

#### REGIONAL VARIATIONS IN ANTIMICROBIAL USE IN FARM ANIMALS AND THE IMPLICATIONS FOR ONE HEALTH ANTIMICROBIAL STEWARDSHIP

Mark Bryan, Elena Knupfer

VetSouth, Winton, New Zealand

**Background:** The New Zealand Veterinary Association has set an aspirational goal of significantly reducing the use of all antimicrobials in animals to limited therapeutic options only by 2030. A key part of this strategy is identifying areas where use can be modified, particularly amongst antimicrobials that are deemed critical.

**Methods:** Data were gathered from veterinary clinics servicing a nationwide group of monitored dairy farms. All antimicrobials purchased by the farms were recorded for a twelve month period. Denominator data were collected, and the level of antimicrobial use on dairy farms was calculated using the quantity of active ingredient divided by the population correction unit (PCU) or standard biomass.

**Results:** Total mean annual use of antimicrobials for monitored dairy farms in the 2014-2015 season was 8.65mg/PCU. Penicillins were the most commonly sold antimicrobial by volume for (74.5%), but there were regional variations in proportion of different active. The overall use differed significantly between regions ( $p<0.01$ ). There was a herd size by region interaction in overall usage ( $p=0.011$ ).

**Conclusions:** Regional variations in total antimicrobial use, and in type of active used, need to be better understood to better target appropriate reduction strategies.





## BUILDING AN AFRICAN LEPTOSPIROSIS NETWORK

Jackie Benschop<sup>1</sup>, Kathryn Allan<sup>2</sup>, Armanda Bastos<sup>3</sup>, Julie Collins-Emerson<sup>1</sup>, John A. Crump<sup>4</sup>, Gauthier Dobigny<sup>5</sup>, Mohamed El Azhari<sup>6</sup>, Wael F.El-Tras<sup>7</sup>, Ahmed Fayaz<sup>1</sup>, Stephane Kouadio Koffi<sup>8</sup>, Johanna Lindahl<sup>9</sup>, Georgies Mgode<sup>10</sup>, Mark Moseley<sup>11</sup>, Benjamin Mubemba<sup>12</sup>, Preneshni Naicker<sup>13</sup>, Soanandrasana Rahelinirina<sup>14</sup>, Fanjasoa Rakotomanana<sup>14</sup>, Pierre-Alain Rubbo<sup>15</sup>, and other members of the African Leptospirosis Network.

<sup>1</sup>Massey University, New Zealand; <sup>2</sup>University of Glasgow, Scotland; <sup>3</sup>University of Pretoria, South Africa; <sup>4</sup>University of Otago, New Zealand; <sup>5</sup>Université d'Abomey-Calavi, Benin; <sup>6</sup>Pasteur Institute of Morocco, Morocco; <sup>7</sup>Kafrelsheikh University, Egypt; <sup>8</sup>Université Félix Houphouët-Boigny, Cote d'Ivoire; <sup>9</sup>International Livestock Research Institute, Kenya; <sup>10</sup>Sokoine University of Agriculture, Tanzania; <sup>11</sup>University of Aberdeen, Scotland; <sup>12</sup>Copperbelt University, Zambia; <sup>13</sup>University of Cape Town, South Africa; <sup>14</sup>Institut Pasteur de Madagascar, Madagascar; <sup>15</sup>Institut Pasteur de Bangui, Central African Republic.

Although leptospirosis is a disease of global importance, local context is crucial to formulating effective intervention strategies. Factors including reservoir host species, pathogen type, environmental, and social settings generate context-specific epidemiologies. Diverse climatic zones, agricultural systems, urbanization patterns, and cultural practices in Africa are likely to drive considerable variation in leptospirosis epidemiology. There is growing evidence of a substantial burden of human leptospirosis in Africa that is difficult to quantify in part due to lack of surveillance and clinical awareness of leptospirosis. Leptospirosis is therefore rarely considered as a differential diagnosis for acute febrile illness, and there is little access to diagnostic services for leptospirosis on the continent. In 2016, a virtual network was founded focussing on improving awareness and understanding leptospirosis in Africa. We currently have 41 members from academia, clinical practice, government and non-governmental agencies and others. Current members are based predominantly in institutions outside the continent but increasingly colleagues based in public health, laboratories, veterinary, and academic institutions within Africa are joining. We will share our experiences of developing this network, and our plans for capacity building through identifying and

addressing knowledge gaps in our understanding of leptospirosis in Africa.

## PDQEX: RELIABLE NUCLEIC ACID EXTRACTION FOR IN-FIELD AND AT THE POINT-OF-CARE APPLICATIONS.

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Previously we have shared development of two technologies aimed at translating complex molecular diagnostic screening tests from the laboratory to in-field and point-of-care settings. In this presentation we will update development of the PDQeX - a simple, automated DNA extraction system - presenting validation data from a variety of sample types. Sample is loaded into the PDQeX Extraction Tube which also contains nucleic acid extraction reagents. The Extraction Tube is sealed and placed into the PDQeX device. Once in the PDQeX device the operator does not handle the sample again until the DNA has been extracted. This reduces the possibility of sample cross-contamination. In this presentation we will show our first experiments using the PDQeX in the field to perform a simple screening test and outline the technical developments we are undertaking to create a more portable DNA extraction technology.

## THE EFFECT OF EMPOWERMENT AND SELF-DETERMINATION ON HEALTH OUTCOMES

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There remains a persistent gap in health outcomes between wealthy and poor countries. Basic measures such as life expectancy, Infant and Under-Five mortality remain divergent, with preventable deaths





being unacceptably high, despite significant efforts to reduce these disparities.

We examine the impact of empowerment, measured by Freedom House's ratings of country's political rights and civil liberties, while controlling for per capita GDP, secondary school enrollment and income inequality, on national health outcomes. Using data from 1970-2013 across 149 countries, our results suggest, quite strongly, that higher levels of empowerment have a significant positive association with life expectancy, particularly for females, and lower rates of Infant and Under-Five mortality.

Our results point to the need for efforts to stimulate economic growth be accompanied with reforms to increase the levels empowerment through increasing political rights and civil liberties.

#### HEALTH CONSEQUENCES OF WORK-LIFE CONFLICT: A QUALITATIVE INVESTIGATION OF THE EXPERIENCES OF FEMALE ACADEMICIANS IN PAKISTAN.

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**Background:** The dynamics of higher education institutions in Pakistan have become extremely demanding where professional growth is subject to proficiency in academics, administration and research. This presses women academicians creating immense work-life conflict. This study aims to explore the detrimental effects of work-life conflict on the health of working mothers.

**Methods:** Study utilizes in-depth qualitative interviews of respondents purposefully sampled from five state universities in Lahore, Pakistan. Confidentiality and anonymity of the respondents was ensured. Data was analyzed through thematic analysis.

**Findings:** The dilemmas of demanding profession and domestic responsibilities have led to multiple psychological and physical health issues. Young academicians are experiencing stress, anxiety and depression which ultimately decrease quality of life. The health issues exceed to physical ordeal as respondents highlighted that they feel exhausted and lethargic. Most recurrent turmoil is sleeplessness and muscle spasm.

**Conclusion:** The major aspiration of mothers to join workforce is to achieve a better lifestyle. The ultimate desire of developing a career is physical, social and psychological well-being. Unfortunately reality is the other way around where working women's health is deteriorating from a very young age unabling them to acquire and relish the life made with utmost efforts.

#### SCREENING FOR LATENT AND ACTIVE TUBERCULOSIS IN DIABETES MELLITUS PATIENTS IN BANDUNG, INDONESIA: A PREVALENCE STUDY

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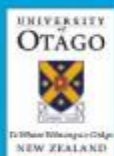
**Background:** Diabetes Mellitus (DM) patients are at a higher risk of acquiring Tuberculosis (TB). This study aimed to describe the screening process and resulting prevalence of latent and active Tuberculosis infection in a DM population in Bandung, Indonesia.

**Methods:** As part of the TANDEM program ([www.tandem-fp7.eu](http://www.tandem-fp7.eu)), DM patients attending a referral hospital and primary health centres underwent screening for active and latent TB infection. Active TB was investigated by symptom screen, chest x-ray, sputum smear and culture. Latent TB was determined using interferon gamma release assay (IGRA).

**Results:** From 809 patients recruited, 715 (88.4%) were categorized as "no TB", 66 (8.2%) were "possible TB", 15 (1.8%) were under TB treatment at the time of recruitment, and 13 (1.6%; 95% CI 0.7-2.5) were bacteriologically confirmed TB. In a sub-set of 552 DM patients screened for latent TB infection and categorized as "no TB", 38.9% (95% CI 34.7-43.2) had a positive IGRA after excluding 22 indeterminate results.

**Conclusions:** Finding active TB in DM patients is clinically important and screening for latent TB infection may be of benefit for TB disease prevention in this high risk group.





## A FORMULATION APPROACH TO IMPROVE AEROSOLIZATION OF POWDERS FOR INHALATION TO COMBAT DRUG-RESISTANT PULMONARY INFECTIONS

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**Background:** Pulmonary infections are a major global health burden. The rapid emergence of drug-resistant pathogens has aggravated the current situation. One of the contributing factors of drug resistance is sub-therapeutic levels of drugs at the infection site. Direct delivery of drugs to the infected lung as powder could improve the therapy. High dose delivery using dry powder inhaler (DPI) requires highly aerosolizable powders. The hygroscopicity of drugs is a particular risk for good aerosolization. This study aimed to develop a formulation approach to produce highly aerosolizable powders of a hygroscopic drug by coformulating with a hydrophobic compound using spray-drying.

**Methods:** Kanamycin powders (hygroscopic drug) with or without rifampicin (hydrophobic compound) were produced by a Buchi Mini Spray-dryer. The *in vitro* aerosolization efficiency was determined using a next generation impactor (NGI). The powders were also characterized for other physicochemical properties.

**Results:** Inhalable powders (1.1-5.9  $\mu\text{m}$ ) were produced with flake-shaped morphology of the combination powder. The combination powders aerosolized better (FPF:  $76.6 \pm 3.8\%$ ) than kanamycin-only (FPF:  $31.3 \pm 1.8\%$ ). All spray-dried powders were amorphous in nature.

**Conclusions:** Cospray-drying of hygroscopic kanamycin with hydrophobic rifampicin improves aerosolization, which may help to combat drug-resistant pulmonary infections. Further studies are required to understand the mechanism for improved aerosolization.

## HIGH PREVALENCE OF ESBL- AND CARBAPENEMASE-PRODUCING ENTEROBACTERIACEAE AMONG PATIENTS WITH SEPSIS IN YANGON, MYANMAR

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**Background:** Data regarding the prevalence and types of extended-spectrum  $\beta$ -lactamase (ESBL) producing gram-negative bacteria and carbapenem-resistant *Enterobacteriaceae* (CRE) in Myanmar are limited.

**Methods:** We studied gram-negative bacteria isolated from the bloodstream of adult inpatients with suspected sepsis at three hospitals in Yangon from July through December 2014. Isolates were identified by standard laboratory methods. Antimicrobial susceptibility testing and detection of ESBL and carbapenemase production were performed by methods of the Clinical and Laboratory Standards Institute. Genes encoding ESBLs and carbapenemases were analyzed by polymerase chain reaction.

**Results:** Among 42 gram-negative bloodstream isolates, 34 (81%) were *Enterobacteriaceae* and 8 (19%) were non-fermenting bacteria of glucose. Twenty (59%) *Enterobacteriaceae* were multidrug resistant (MDR) while 7 (21%) were extensively drug resistant (XDR). All isolates were susceptible to polymyxin. Phenotypic methods detected production of ESBLs and carbapenemases among 16 (38%) and 6 (14%) of all isolates respectively. Molecular analysis by sequencing confirmed presence of the CTX-M 15 gene among 13 (81%) of 16 ESBL producers and NDM in all carbapenemase producing *Enterobacteriaceae*.

**Conclusions:** The high prevalence of ESBL- and carbapenemase-producing gram-negative bacteria among bloodstream isolates from hospitalised patients in Yangon, Myanmar, raises concerns for the treatment of patients with gram-negative sepsis





## EARLY CLEARANCE OF *MYCOBACTERIUM TUBERCULOSIS* INFECTION

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Early clearance is the eradication of inhaled *Mycobacterium tuberculosis* (*Mtb*) by innate mechanisms before an adaptive immune response develops. To study early clearance we have recruited a large cohort of household contacts of smear positive TB cases in Indonesia who have been assessed for *M. tuberculosis* infection by Interferon Gamma Release Assay at baseline and 14 weeks later. A questionnaire that quantified exposure to the case was performed at baseline and blood was drawn. Low neutrophils and immature granulocytes in contacts were associated with an increased risk of *M. tuberculosis* infection. This suggests a role for neutrophils in early clearance of *M. tuberculosis*; a finding that can be explored further in studies on the cohort.

## RISK FACTORS FOR ACUTE LEPTOSPIROSIS IN NORTHERN TANZANIA: A PROSPECTIVE COHORT STUDY

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**Introduction:** Leptospirosis is a major cause of fever in Africa but little is known about risk factors for infection. We assessed risk factors for acute leptospirosis in northern Tanzania.

**Methods:** We enrolled patients with fever from two hospitals in Moshi, Tanzania, from 2012-2014 and performed *Leptospira* microagglutination testing on acute and convalescent serum. Cases required a four-fold rise in antibody titres or a single titre  $\geq 800$ , and controls required titres  $< 100$  in both serum samples. We assessed risk factors over the preceding month using a structured questionnaire. We calculated odds ratios (OR), and combined risk factors to aggregate exposure to livestock, rodents, and surface water.

**Results:** Of 1,446 participants enrolled there were 24 (1.7%) cases and 592 (40.9%) controls. An increasing cattle exposure score (crude OR 1.2,  $p=0.02$ , adjusted OR 1.2,  $p=0.04$ ), cleaning cattle waste (OR 4.3,  $p=0.003$ ), feeding cattle (OR 3.9,  $p=0.02$ ), farm work (OR 3.3,  $p=0.01$ ), and rice farming (OR 14.6,  $p<0.001$ ) were associated with leptospirosis. On multivariate logistic regression, cleaning cattle waste (OR 5.4,  $p=0.01$ ), rodent killing (OR 6.0,  $p=0.01$ ), and rice farming (OR 14.6,  $p<0.001$ ) were risk factors.

**Conclusions:** Cattle contact was a risk factor for leptospirosis suggesting control strategies for livestock might reduce Cattle contact was a risk factor for leptospirosis suggesting control strategies for livestock might reduce human disease