

NPGH Fogarty Fellows March 2016 Newsletter

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NPGH Fogarty Global Health Fellows Newsletter January-March 2016



Mentor Spotlight: Cecilia Shikuma, MD

University of Hawaii

Cecilia Shikuma, MD is Professor and Edwin C. Cadman Endowed Chair in the Department of Medicine, John A. Burns School of Medicine at the University of Hawaii – Manoa. She directs the Hawaii Center for AIDS (HICFA), a Center at the University focused on HIV/AIDS care, training and research. This Center includes an HIV/AIDS Clinical Trials Unit, research laboratories and an HIV primary care and specialty clinic now located within the premises of the medical school. Her personal research interests focus on the effects of HIV immunologic dysfunction on chronic diseases such as cardio-metabolic disease and neuroAIDS.

How does HIV infection interact with or influence chronic disease? Does antiretroviral therapy help?

Depletion of CD4 T cells and the immunodeficiency that result from HIV infection are well known but more recently research has shown that HIV infection is associated with an increase in chronic inflammation. It is now believed that this increase in chronic inflammation is responsible, to a large degree, for the chronic non-infectious complications of HIV which is typically similar to diseases that occur as an individual ages. For example, this higher rate of inflammation is felt to result in higher rates of diabetes, cardiovascular disease and cognitive impairment in the HIV-infected population compared to the general population. Antiretroviral therapy does decrease the level of chronic inflammation due to HIV but typically not down to levels seen in the general population.

Have there been any recent findings that you are excited about?

We have been interested in the role of monocytes and macrophages in the development of these chronic complications of HIV. We have recently contributed information, either in abstract form at major HIV conferences or as publications, that higher rates of activated monocytes/macrophages (non-classical monocytes) are found in HIV-infected individuals who have subclinical evidence of atherosclerosis and in those with microalbuminuria, a precursor to chronic renal failure. Monocytes/macrophages are believed to also contribute heavily to cognitive impairment in HIV. We recently published that antiretroviral treatment intensification with maraviroc (Selzentry®), a drug with increased anti-HIV efficacy in monocytes/macrophages, appear to lead to cognitive improvement over 24 weeks in HIV infected individuals who had mild to moderate cognitive impairment at entry into the study.

How did you start working in Thailand?

We were interested in setting up a collaboration internationally in our neuroAIDS work. We chose to investigate the possibility of working with collaborators in Thailand because a former investigator with HICFA was at that time working for the US military conducting a major HIV vaccine trial. We were able to obtain a small NIH (R21) grant to conduct neuroAIDS research which then eventually led to a series of larger grants to study not only neuroAIDS but also lipodystrophy and peripheral neuropathy. HICFA is now known as a consortium called SEARCH, a collaboration between HICFA and two other partners: the Thai Red Cross AIDS Research Centre (TRCARC) and HIV-NAT in Bangkok, and the Armed Forces Medical Sciences (AFRIMS) in Bangkok.

How did you get involved with the Fogarty Fellows?

Our medical school's Department of Tropical Medicine, Medical Microbiology and Pharmacology was part of the consortium which applied for and eventually was funded as the Northern Pacific Global Health Research Fellows Training Consortium. I was one of the potential mentors proposed for the Consortium.

What do you like about mentoring?

One of the aspects I like most about mentoring is the ability to interact with junior investigators. They bring renewed excitement and new research ideas to the table, and I find myself energized and excited as well about the possibilities they are envisioning.

Alumni Spotlight: Michael Mahero

One Health in Uganda

[Michael Mahero](#) recently presented a poster on the "Eco-epidemiology of malarial and non-malarial febrile illness in western Uganda" at the One Health for the Real World: Zoonoses, Ecosystems, and Wellbeing Symposium at the Zoological Society of London on March 18th. The poster was about a study he's been working on examining behavioral risk factors for fever in rural and urban residents of Hoima and Kasese.

Understanding and Mitigating Potential Risk Factors Associated with Herd Level Brucella Seropositivity and Smallholder Dairy Farms in Kosovo
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INTRODUCTION
The process of producing, processing and marketing dairy products is complex and includes potential hazards that occur throughout the production cycle. Potential threats to human health related to dairy products and dairy farming include: lack of or errors in milk pasteurization, consumption of raw milk products, contamination of milk products by heat resistant pathogens, emergence of antimicrobial resistance in zoonotic pathogens.
One zoonotic pathogen associated with raw milk products is *B. abortus*. *B. abortus* is the causative organism of brucellosis, a disease of both wild and domesticated animals. Human infections occur after ingestion of contaminated animal products, direct contact with infected animals, or inhalation of aerosols.
According to the WHO, up to 20,000 of the 200,000 annual cases of human brucellosis in the world occur in Europe (Papavasiliou, Papadimitriou, Batsidakis, Christou, & Tsamir, 2006). Tseleki et al. (2002) reveal that brucellosis was endemic in Kosovo amongst cattle, sheep and goats herds.
Therefore the aim of the study was to generate information that would be used by the government and extension services in Kosovo to improve their surveillance and control of brucellosis.

GOALS
The goal of the study was to develop management practices in Kosovo that reduce the risk of detectable Brucella antibodies in smallholder dairy farms through collaborative field-based research and extension specialists from the University of Wisconsin-Madison.

OBJECTIVES
The objectives of the study were to: 1) determine the prevalence of Brucella among small holder dairy farms in Kosovo; 2) identify risk factors associated with Brucella seropositivity in these farms; and 3) develop management practices to reduce Brucella prevalence in these farms.

BACKGROUND
Brucella is a zoonotic pathogen that causes brucellosis in humans and animals. It is a leading cause of zoonotic disease worldwide. Brucella is a gram-negative, facultative intracellular bacterium that can survive in the environment for several months. Brucella is transmitted to humans through direct contact with infected animals or their products, or through consumption of unpasteurized dairy products. Brucella is also transmitted to animals through direct contact with infected animals or their products, or through consumption of unpasteurized dairy products. Brucella is a leading cause of zoonotic disease worldwide. Brucella is a gram-negative, facultative intracellular bacterium that can survive in the environment for several months. Brucella is transmitted to humans through direct contact with infected animals or their products, or through consumption of unpasteurized dairy products. Brucella is also transmitted to animals through direct contact with infected animals or their products, or through consumption of unpasteurized dairy products.

METHODS
A cross-sectional study using a two-stage sampling strategy was carried out in selected regions of Kosovo between January 2011 and April 2012, to identify risk factors associated with brucellosis seropositivity and to assess the use of biosecurity-related management practices among small holder dairy farms in selected regions of Kosovo (milk collection points: Pashtriku and Suhareke) and Prizren (milk collection points: Oltan and Kllon e Epërme), using a one-visit risk (exposure) assessment tool.
The risk assessment tool included a demographic section that profiled the farms according to several pre-selected parameters such as farm location, herd structure, and herd health. The risk scoring portion of the risk assessment tool had three major sections: the milk handling practices, treatments and drug use, and biosecurity and disease control. For each section, a risk score was developed to assess the farmer's typical practices. The higher the risk score, the riskier the management or biosecurity practices. This tool was developed in English and later translated into Albanian for use on farms.
Milk sample collection was performed at milk collection centers four times during the 2011-2012 study year. IDEXX and In-house Indirect Milk ELISA for the detection of antibodies against Brucella abortus were used to assess

DEVELOPING A SOLUTION
Candid and open discussions between stakeholders were held to formulate a comprehensive plan that would promote safety and animal health through private public partnership. Working Group was formed as a collaborative initiative to enhance milk safety, strengthen extension services and capacity building of the following groups: University of Wisconsin-Madison, University of Minnesota, University of Prishtina, Kosovo C-DEP, Babcock Institute, Veterinary and Food Laboratory, Faculty of Agriculture/Veterinary, University of Prishtina, Office of the Prime Minister, Food and Veterinary Agency, Republic of Kosovo.

RESULTS
A total of 256 farms were enrolled in the study over a 6-month period. Brucella tests were conducted on bulk milk samples from 208 farms and 11 of these farms (5.4%) were Brucella positive. All Brucella positive samples were from farms in the Kllon e Epërme and Pashtriku regions. From multiple analyses, farmer age-group was the only factor significantly associated with Brucella positivity. The lower the age of the farmer, the higher the risk of bulk tank milk positivity to 0.001 (p=0.001). A higher proportion of younger farmers (30-39 years) had inadequate risk cow handling biosecurity practices or no inactivator for milk, and did not house the all year round. Most farmers in the study produced viable examination of purchased cattle prior to purchase which consulted a veterinarian who performed physical examination on all purchased cattle. These factors could contribute to greater chance of infected cattle being introduced onto the farm.

Figure 3 Photo showing a cow on pasture on a small holder dairy farm in Kosovo

Figure 4 A cross-sectional study using a two-stage sampling strategy was carried out in selected regions of Kosovo between January 2011 and April 2012, to identify risk factors associated with brucellosis seropositivity and to assess the use of biosecurity-related management practices among small holder dairy farms in selected regions of Kosovo (milk collection points: Pashtriku and Suhareke) and Prizren (milk collection points: Oltan and Kllon e Epërme), using a one-visit risk (exposure) assessment tool.

Figure 5 Consultative Process/Capacity Building

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Michael presents a poster on Brucellosis in small holder dairy farms and the associated risk factors at the 2015 One Health Congress in Amsterdam.





Michael cruises around Lake Bunyoyi in Western Uganda-a great biodiversity hotspot within his study location. A fun way to enjoy the beautiful scenery as he scouted the area for more research opportunities.

Michael consults with the person in charge of data at the Kigorobia Health Center IV in Hoima, Uganda during their medical record reviews.



Trainee Spotlight: Shama Virani

Breast Cancer in Thailand

[Shama Virani](#), PhD is a current NPGH Fogarty Fellow studying risk factors for breast cancer in Thailand. She made several trips to Thailand before starting her fellowship, while working on her PhD in toxicology at the University of Michigan.

In our continuously changing world, the idea of health and how to achieve it is a complex puzzle. There are so many nuances and intricacies to consider that it is virtually impossible to see a clear picture of what needs to be done. Even when you think you have the answer, another solution can present itself. The epidemiology of disease can seem to have infinite possibilities. It's the small moments of understanding that get us closer to solving this puzzle. These finite moments are what scientists strive for and what I hope to provide during my fellowship.

I go by many names; cancer epidemiologist, population scientist, molecular biologist. Regardless of the title, the essence of my work lies in understanding non-communicable disease (NCD) trends in populations, providing evidence for policy level decision making, and promoting prevention and down-staging strategies.

All of these ideas focus on one underlying theme: figuring out how a population's lifestyle and environment contributes to disease and developing ways to circumvent those contributions to reduce the risk of disease.

The global burden of non-communicable disease is increasing, particularly in low- and middle-income countries (LMICs). Southeast Asia, the focus of my concentration, is notable in this regard. Considering the rapid population growth of SE Asia, which is mostly comprised of LMICs, and the foreseen burden, it is crucial to focus our efforts on developing high quality surveillance systems to track the NCD burden and understanding these populations and their risk for disease. An important attribute of population science is the recognition that populations differ in their risk of disease. The same exposures in different populations can have varying effects depending upon lifestyle factors, genetics and behaviors. Conversely, the same diseases in different populations can be due to distinct population-specific factors.

These concepts are the foundation for my passion in my work in Thailand. My Fogarty fellowship is focused on providing cancer surveillance evidence for policymakers and identifying population-specific risk factors that can help explain increasing incidence of cancer. Using available cancer registry data, we are able to spatially map cancer rates and characterize and project incidence trends to identify vulnerable populations and cancers with the largest burdens. Thailand is made up of four main regions, each with unique social, cultural and geographical elements. The types of cancers that present in each region are largely dependent upon these factors. For

example, liver cancer has the highest incidence in the northeast due to high consumption of raw and fermented fish, which contains a parasitic liver fluke. Lung cancer is most common in the north, potentially due to the large number of tobacco plantations for cigarette industry in Thailand. Each region has its own unique cancer profile and I, along with our team of scientists, are working to assess these profiles regionally. We are also interested in the burden of cancer in HIV patients and are working to combine our registry data with HIV registries to assess cancer incidence in this vulnerable population.

Nationally, breast cancer is the leading cancer in women in Thailand. It is also the top cancer in women in the southern region of Thailand. The little research that has been done on breast cancer risk factors in Asian women shows that while the risk factors identified in Caucasian populations are present, the extent to which they are applicable to risk is highly variable. In addition, populations in LMICs that don't exhibit classical risk factors have high rates of breast cancer. We've conducted focus groups around southern Thailand to ask women about their lifestyles, environments, neighborhoods and behaviors. Using this information we are currently developing a prospective case-control study to assess potential novel, population-specific, risk factors in the Thai population.

Although cancer epidemiology in Thailand is complex, every study weaves a new consideration into an existing nest of research and understanding. My experience as a scientist in Thailand differs greatly from my education in the west, in that it has taught me that we are not just running against the clock of life and death but of changing societies, cultures, and ideologies. Every population is different and what we know today can rapidly change tomorrow. We cannot simply apply what we've learned from one population to the rest of the world. This is the beauty and complexity not only of the epidemiology of disease, but of the human race. By providing insight into the Thai population, I hope to contribute integral pieces to this ever-changing puzzle of human health.



Shama and her colleague use input from community members to improve the language and applicability of the questionnaire they will use in the district of Chana, Thailand.

Launch of Uganda Hub

The Uganda Hub was established in August 2015 by the University of Minnesota Academic Health Center and is guided by the Minnesota-Uganda Partnerships Group convened by the Center for Global Health and Social Responsibility (CGHSR). The day-to-day work of the Uganda Hub is run by CGHSR's Kampala-based operations manager, Martha Kandole out of our office and UMN work space on the 5th floor of MUJHU tower 3.

Anchored in a strong foundation of collaborative exchange since 2005, the Uganda Hub aims to increase regional and international engagement on pressing global health challenges using key partnerships and interdisciplinary connections created during the last decade.

See more on their website: <http://globalhealthcenter.umn.edu/news/minnesota-launches-uganda-hub>





Barclay Stewart

Tips for Publication Productivity

[Barclay Stewart](#) has worked in Ghana under the mentorship of Prof. Charles Mock and with local collaborators Dr. Adam Gyedu, and Profs. Donkor and Quansah. Together they have assessed the trauma care landscape with regards to population-level spatial access to care, facility-level trauma care capacity, and system-level emergency and trauma care planning and organization. Barclay and Dr. Gyedu have worked on projects related to injury prevention and epidemiology, and advocacy for persons living in conflict and complex humanitarian emergencies. Together, they have produced more than 40 published, accepted or submitted peer-reviewed manuscripts, several book chapters, and more than 10 international abstract presentations.

1. Plan ahead, act ahead

- Plan projects well ahead of time
- Keep a list of project ideas ready for when opportunity knocks
- Anticipate roadblocks
- Get your IRB approvals early and write your proposals broad so that you can do more than one study using the same approval

2. Collaborate and accept opportunities

- The broader your net the more you catch
- Work with folks for the right reasons: get useful work done well, create a complementary team, support and advance your colleagues, share tasks
- Avoid saying 'no,' at least early on to build experience

3. Work in parallel, not in series

- Roadblocks are everywhere! Some can be anticipated
- Take on several projects; push through the starts of them; they will settle out as time goes on
- When a rate-limiting step of one comes up, you can work on the others

4. Read and write, a lot; and get feedback

- Get comfortable with writing by writing a lot
- Solicit feedback from people who are much stronger and experienced writers
- See patterns in feedback and avoid the repeated mistakes
- Create a mental template for manuscripts so that writing time is efficient

5. Edit, a lot

- Look for opportunities to edit outlines and drafts of other people's work
- You'll be amazed how you see issues with organization, concept conveyance, grammar, etc. when reading others' work that you don't see in your own work
- Compare your critiques with your mentors' critiques of someone else's work to see where you could have done

better

6. Get plenty of juice for the squeeze

-Design projects so that they get the right data to answer several important questions
-Think about getting several manuscripts from one project: systematic review or meta-analysis, new methods?, description, intervention, subgroups, comparison

7. Use what's out there

-There are so many data already published; use them!
-Use the literature to generate or compile evidence while your study is ongoing for: narrative and critical reviews, scoping reviews, systematic reviews, meta-analyses

8. A bit of philosophy

-Ride the wave of community success; build on each others works
-It's about the work and the network, not the names/order of authors
-Balance: Who is important? What is important? There is more out there than writing!

9. Equity in authorship

-Don't make this fake or post-hoc; engineer it into your projects from the start
-Capitalize on the complementary interests and skills of your team when creating projects to get each person authorship or first-authorship
-It is not worth breaking the trust or respect of your colleagues by demanding order in a study



Mental Template for a Manuscript

1. **Introduction:** problem, conceptual framework, contextual facts and research gap, 'to address the gap' and aims.
2. **Methods:** paper dependent, clear and concise, leave nothing for reviewers and other scientists to question, supplementary material can be helpful
3. **Results:** follow the order of the study/methods and set up the discussion
4. **Discussion:** aim, main findings, and one big take-home; contextualize your findings; frame findings for the way forward or propose and support potential changes to perspective or practice; limitations
5. **Conclusion:** brief summary, actionable next steps or recommendations (practical, research or funding)

In Case You Missed It



Fogarty alumna and mentor Magaly Blas won a CONCYTEC/L'Oreal award recognizing her "effort and dedication as a woman in science and investigation." Congratulations Magaly! The prize includes over \$13,000!



Fogarty FICR-S alum Tripper Sauer attended the World Ophthalmology Conference, February 5-9 in Guadalajara. He met with many ophthalmologists from Latin America and attended several interesting talks on epidemiology and Latin American vision impairment. Tripper also received useful feedback on his poster including how to present the data in a more straightforward manner.



Alum [Bart Ondigo](#) attended a neglected tropical disease workshop in November 2015 in Blantyre, Malawi. During the workshop he met Professor Moses Bockarie from the Liverpool School of Tropical Medicine (LSTM) and Hulda Sang, a PhD student.



[Bozena Morawski](#) delivered an oral presentation at CROI in Boston on Pre-ART Cryptococcal antigen titer associated with preemptive Fluconazole failure. A video of the presentation is available [here](#).



[Segundo Leon](#) recently published two manuscripts related to his Fogarty research project in Peru.

[High prevalence of extra-genital chlamydial or gonococcal infections among men who have sex with men and transgender women in Lima, Peru.](#)

[Field Evaluation of a Dual Rapid Immunodiagnostic Test for HIV and Syphilis Infection in Peru.](#)



[Kristen Heitzinger](#)'s work on water storage in Peru was recently published in Epidemiology and Infection.

[The challenge of improving boiling: lessons learned from a randomized controlled trial of water pasteurization and safe storage in Peru.](#)



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