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## Editorial: From the Director's Chair – a vision for SACEMA in its second decade

*Juliet Pulliam - Director of SACEMA.*

It's been nearly two months since I took over from Alex Welte as director of SACEMA, and with this issue of the *SACEMA Quarterly*, I'm taking the opportunity to reflect on what I've learned so far about the challenges – and the many exciting opportunities – ahead for SACEMA.

As we are all aware, Africa faces many challenges, particularly with regard to health. A recent analysis estimated that, of the 38.8 million people living with HIV worldwide in 2015, more than three-quarters resided in sub-Saharan Africa (1). At the same time, incidence of chronic non-communicable diseases, such as diabetes and cardiovascular disease, is increasing in many countries across the continent, mirroring patterns elsewhere (2). The devastating effects of the recent Ebola epidemic in West Africa also demonstrated all too clearly that the continent remains vulnerable to unforeseen threats that will require a swift response (3,4). Addressing these challenges will require many types of expertise and collaboration across sectors, but I believe these challenges can and will be met. I also believe that SACEMA has a vital role to play. By serving as a hub of expertise in epidemiological modelling and analysis, SACEMA will provide a scientific foundation for addressing these challenges – through work that furthers our understanding of disease dynamics, improves estimates and projections of disease occurrence, guides assessment of potential interventions, and helps to identify the best management strategies.

Playing this role will, necessarily, require continued scientific excellence. However, I view scientific excellence as a far-from-sufficient ambition for SACEMA. Over the next five years, I intend to increase SACEMA's impact in three key ways. First, I will expand our focus on capacity development. Second, I will tailor our research focus to address the most important knowledge gaps for improving public health in Africa. And, third, I will increase SACEMA's engagement with the global research community.

The activities that will achieve these goals are not necessarily distinct. For example, I plan to work with organizations within South Africa and around the continent to create training and career pipelines that will ensure our students gain practical experience during their degree programs and that our graduates find jobs in the places their skills are most needed – an effort that will address all three aims. Similarly, I will develop new mechanisms for scientific exchange, bringing researchers at all levels – from undergraduates to senior scientists – to

SACEMA from abroad, and sending students and staff for extended research visits to international institutions. These exchanges will not only increase SACEMA's visibility within the global research community but will also help nurture a dynamic research environment in which students and staff are continuously exposed to new ideas and perspectives, encouraging them to push both their intellectual and cultural boundaries.

In fact, I believe that it is precisely this type of diversity and intellectual exchange that will foster the continued scientific excellence necessary to meet Africa's public health challenges. This belief stems in no small part from my own academic background. Before I wrap up, I would therefore like to share a little of my background and, for those of you who don't know me, the history behind how I ended up in the director's chair.

I come to SACEMA from the University of Florida, where I was an Assistant Professor in the Department of Biology and Emerging Pathogens Institute. I have a long-standing interest in integrating mathematical models with field data to address biological questions, which was shaped early on by my undergraduate research on the demography and long-term population trends of savannah baboons. As a graduate student, I shifted my focus to studying infectious diseases. Since 2002, I have focused on applying quantitative approaches from the fields of infectious disease dynamics, quantitative ecology, epidemiology, and biostatistics to understand cross-species transmission and pathogen invasion dynamics. I received a PhD from Princeton University's Department of Ecology and Evolutionary Biology in 2007, with a dissertation entitled *Determinants and Dynamics of Viral Host Jumps*. I then spent a year as a postdoctoral fellow at Emory University's Center for Disease Ecology, where I also enrolled in formal coursework in epidemiology and public health. In 2008, I moved to the Division of International Epidemiology and Population Studies at the US National Institutes of Health's Fogarty International Center, where I was a Research and Policy for Infectious Disease Dynamics (RAPIDD) Postdoctoral Fellow until I moved to Florida in 2011. Throughout this time, my research has focused mainly on zoonotic diseases – i.e., those transmitted from animals to humans – and, more recently, mosquito-transmitted infections. I've specialized in viruses that cause severe disease in humans, such as Nipah encephalitis, Japanese encephalitis, Dengue fever, and Ebola virus disease, and I have a strong interest in epidemiological methods, particularly in relation to inference and estimation in data-limited settings.

Although I have worked and studied in the US for most of my career, my research and training activities have always had an international focus. My first interaction with SACEMA was in 2008, as a faculty member for the Advanced Study Institute (ASI) in Mathematical Epidemiology, a two-week program held at the African Institute for Mathematical Sciences (now AIMS-South Africa), which was run as a collaboration between AIMS, SACEMA, and DIMACS (the Center for Discrete Mathematics and Computer Science at Rutgers University). Having received my PhD just over a year before, I was excited to have the opportunity to share my skills and experience with students interested in modeling infectious disease dynamics; however, having a PhD in Ecology and Evolutionary Biology, rather than mathematics, I found the prospect of teaching at an institute hosting many of Africa's top junior mathematicians to be rather daunting. As it turned out, I need not have felt so intimidated. While it was true that my formal mathematical training hardly outpaced that of the students I was there to teach, I quickly learned that there were many other aspects of my scientific training – much of which I had, up to that time, taken for granted – that were of great value to share, and that the students were motivated to learn new skills and eager to broaden their scientific horizons in a way I had rarely encountered in the US. I took this new perspective and ran with it, working with my co-instructors to revamp the ASI program, incorporating sessions on scientific programming, strategies for reading and writing scientific papers, and intensive workshopping of the students' group research projects.

Over the following few years, I worked closely with then-director John Hargrove and others to transform the short-course curriculum from focusing on the mathematical theory of epidemics to providing broad training in data-driven modeling and quantitative epidemiology. By the time Alex took over as SACEMA's director, this effort had developed into the Clinic on the Meaningful Modeling of Epidemiological Data ([MMED](#)), which has been held annually since 2010 and is now a cornerstone of SACEMA's capacity building activities. In 2012, Alex and I secured funding from the US National Institutes of Health to expand our US-Africa training efforts in epidemiological modeling, and over the next few years, I led the expansion of MMED into the International Clinics on Infectious Disease Dynamics and Data ([ICI3D](#)) Program, an interdisciplinary training program in

quantitative epidemiology that features two annual clinics (MMED and [DAIDD](#), the Clinic on Dynamical Approaches to Infectious Disease Data) and a trans-Atlantic research scholars exchange program.

While my own research has focused primarily on zoonotic infections, the ICI3D Program is much broader in scope, covering methods in data-driven modeling and infectious disease dynamics that are applicable to human infectious diseases of major importance in Africa, including HIV/AIDS, tuberculosis (and drug-resistant TB), cholera, trachoma, trypanosomiasis, and malaria. Few programs exist – particularly in the areas of the world most affected by high infectious disease burdens – that explicitly train junior investigators to link models and data for addressing applied public health problems. We designed the ICI3D program to address this gap, and the opportunities that I have been able to provide to students via the ICI3D program have been the most rewarding part of my career to date.

It is therefore with great enthusiasm that I have embarked on this new adventure – moving to South Africa and taking up the Director's chair. As SACEMA begins its second decade, I will do my best to realize my vision of SACEMA as a hub for Africa's thought leaders in epidemiological research – to improve public health decision-making locally, nationally, and across Africa. I hope you will see our progress reflected in future issues of the *Quarterly*.

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