



SACEMA
DST/NRF Centre of Excellence in Epidemiological Modelling and Analysis

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SACEMA NEWSLETTER



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We would like to wish our friends, colleagues and collaborators a Blessed Holiday Season and a Prosperous New Year!



NEWS:

A new scientific research community to focus on network statistics for Sexually Transmitted Infections epidemiology

Epidemics of HIV and other Sexually Transmitted Infections (STIs) continue to cause an unacceptably high burden of morbidity and mortality worldwide, especially in sub-Saharan Africa. The spread of STIs, and consequent implications for prevention and treatment, strongly depend on the sexual networks in which these infections propagate. The Scientific Research Community (SRC), funded by the Flemish Scientific Research Fund (FWO), will formalise the joining of forces between groups that are internationally acclaimed primarily for their work in STI and HIV epidemiology, microbiology and public health and groups that have an international track record in developing and applying advanced statistical methodology and computer simulations for network analysis. In doing so, the SRC aims to advance science and strengthen academic capacity in network statistics and STI epidemiology. To this end, the SRC will implement a research exchange programme, facilitate the development of joint research proposals, and organise a biannual summer school on network statistics.

The envisaged scientific goals of the SRC include the description of sexual networks and their features that mediate STI transmission in men who have sex with men in Flanders, and in heterosexual populations in sub-Saharan Africa, using existing datasets and established network analysis methods; the extension of network analysis methods that exist for static networks to more general methods for dynamic, time-dependent networks underlying STI transmission; and the development and application of a new theoretical framework for modelling HIV (STI) transmission in sexual networks, that unifies sociocentric and egocentric sexual network characteristics with the results of phylogenetic tree analysis.

Besides SACEMA, the SRC consists of the International Centre for Reproductive Health (ICRH) at Ghent University, CenStat at Hasselt University, the HIV/AIDS Centre at the Antwerp Institute of Tropical Medicine, the Heilbrunn Department of Population and Family Health (HDPFH) at Columbia University, the Theoretical Biology Lab at McMaster University, and the Research Methodology Centre at the Human Sciences Research Council (HSRC).

New project on HIV prevention among young women in Malawi

The Flemish Scientific Research Fund (FWO) has approved funding for a new project on HIV prevention among young women in Malawi. It is well established that young women in southern Africa are at very high risk of HIV infection. Biological and behavioural risk factors, in combination with a complex sexual age-mixing pattern, have been proposed to explain this gender discrepancy. Age-mixing patterns characterized by the frequent occurrence of large age differences between sexual partners are thought to be the result of socio-economic inequalities in society. Young women may be participating in sexual relationships with older men in order to gain socio-economic benefits.

The FWO project, involving collaborators from The World Bank, Columbia University, Ghent University and Hasselt University, will investigate the age-mixing pattern and associated trends in socio-economic status and sexual risk behaviour in two settings in Malawi. Further, computer simulation models will be used to explore how changes in the age-mixing pattern affect individual HIV risk and alter the course of the epidemic, taking into account the biology, sociology and behavioural science behind the epidemiology of HIV in young women in Malawi.

NRF rating for Wim Delva



SACEMA is proud to announce that Wim Delva recently received a Y rating from the National Research Foundation. A Y rating is given to young researchers (40 years or younger), who have held the doctorate or equivalent qualification for less than 5 years at the time of application, and who are recognized as having the potential to establish themselves as researchers within a 5-year period after evaluation, based on their performance and productivity as researchers during their doctoral studies and/or early post-doctoral careers. The NRF rating system is a benchmarking system through which individuals that exemplify the highest standards of research, as well as those demonstrating strong potential as researchers, are identified by an extensive network of South African and international peer reviewers. Ratings are based on the quality and impact of recent research outputs.

2013 Graduations

Congratulations to the following SACEMA-funded students who graduated in December:



Doreen Ssebuliba graduated with a PhD in Mathematical Sciences from Stellenbosch University under the supervision of Dr Rachid Ouifki. Her dissertation was titled “Mathematical Modelling of the effectiveness of two training interventions on infectious diseases in Uganda”.



Faikah Bruce graduated cum laude with an MSc in Mathematical Sciences from Stellenbosch University. Her thesis titled “Understanding the Impact of an HIV Intervention Package for Adolescents” was supervised by Dr Leigh Johnson (UCT) and co-supervised by Prof Alex Welte (SU).



Vusie Lokothwayo graduated with an MSc in Epidemiology from the University of the Witwatersrand. His thesis titled “A comparative study on the determinants of HIV infection in Swaziland and Ethiopia” was supervised by Dr Eustasius Musenge (Wits).

We wish our graduates the very best with their future careers!

Visiting researcher: Stéphane Helleringer



Stéphane Helleringer visited SACEMA from 1 to 18 December. Stéphane is Assistant Professor of Population and Family Health at the Mailman School of Public Health and the Columbia Population Research Center, Columbia University in New York. His visit marked the start of the new joint research project on HIV prevention among young women in Malawi (see elsewhere in this newsletter). Besides the statistical analysis of age gaps in sexual relationships and their associations with gradients in socio-economic status indicators, he will also work with Wim Delva on a model that captures the role of preferential mixing by antiretroviral treatment status in mediating the impact of this treatment on the incidence of HIV.

Toy Drive 2013

SACEMA again joined forces with the HR Employee Wellness department of Stellenbosch University and participated in its festive season toy drive. The gifts were delivered to Stellenbosch Hospice, for distribution to patients and affected families in various underprivileged communities in and around Stellenbosch and Cape Town. SACEMA staff and students put together 38 gifts containing a range of cheer inducing delights.



SACEMA staff and students with their wrapped gifts ready to be delivered

EVENTS:

An Introduction to the Joint Modelling of Longitudinal and Survival Data, with Applications in R, 28 October –1 November 2013

This 5-day course was presented at the Stellenbosch Institute for Advanced Study (StIAS) by Associate Professor Dimitris Rizopoulos, who is based at the Erasmus University Medical Center, Rotterdam, the Netherlands. The course was attended by 23 people from a number of countries and a wide range of institutions.

Bayesian Biostatistics, 4-8 November 2013

This 5-day course was presented at the Stellenbosch Institute for Advanced Study (StIAS) by Prof Emmanuel Lesaffre (Department of Biostatistics, Erasmus University Medical Center, Rotterdam, the Netherlands, and Catholic University of Leuven, Belgium).

The course was attended by 15 participants from around Africa – ranging from postgraduate students to department heads, primarily operating in academic institutions in the areas of mathematics or statistics.



Participants of the Bayesian Biostatistics Course, November 2013, Stellenbosch

SACEMA Seminars

The following seminars have been held from October to December:

- 18th October: Faikah Bruce, MSc Defence: *Understanding the Impact of an HIV Intervention Package for Adolescents*
- 18th October: Dr Leigh Johnson, University of Cape Town: *Progress towards preventing and treating HIV in South Africa: insights from mathematical modelling*
- 22nd October: Dr Florian Marx, Resident physician and epidemiologist at the Charité Berlin, Department for Pediatric Pneumology and Immunology, visiting research fellow at the Desmond Tutu Tuberculosis Centre: *From the Inuit in Canada to high tuberculosis burden populations in South Africa – Does previous tuberculosis matter more than we think?*
- 22nd November: Dr Dan Jacobson, Institute for Wine Biotechnology, Stellenbosch University: *Networks and Machine Learning: Creative Solutions to Large, Challenging Data Sets*
- 29th November: Prof Gail D Hughes, Professor and Director of the South African Herbal Science and Medicine Institute (SAHSMI), University of the Western Cape: *Advancing the Potential of Phytomedicine for Chronic Diseases in South Africa*
- 6th December: Prof Stéphane Helleringer, Assistant Professor of Population and Family Health, Mailman School of Public Health and Columbia Population Research Center, Columbia University: *Sexual networks and HIV transmission in Likoma (Malawi)*

SCIENTIFIC MEETINGS:

SAMSA 2013

The 32nd Conference of the Southern Africa Mathematical Sciences Association (SAMSA) 2013 was held in Cape Town from 25th to 29th November 2013. The conference, hosted by the University of Cape Town (UCT), University of Stellenbosch (US), University of Western Cape (UWC) and Cape Peninsula University of Technology (CPUT), was themed “**Capacity building in the Mathematical Sciences: prospects, successes and challenges in the Southern African context**”. SACEMA in-house students, Bewketu Bekele and Cynthia Mazinu presented their work at the conference. The title of Bewketu’s presentation was “Cost and impact of ART scale up in the presence of treatment failure and loss to follow up: a modelling perspective”. Cynthia’s presentation was titled “Estimating HIV treatment coverage in South African ART clinics using a mathematical model”.

UPCOMING EVENTS:

Research Days in March 2014

SACEMA will be holding its annual Research Days meeting over two full days in Stellenbosch in mid-March. At this meeting SACEMA-funded students throughout South Africa will come together and share the interesting work they are involved in.

Quantitative Bias Analysis: 21-23 May 2014

Dr Matthew Fox of the Department of Epidemiology and the Center for Global Health and Development at Boston University will be presenting an intensive three-day course on using quantitative bias methods with epidemiological data, at Stellenbosch University under the auspices of SACEMA.

Clinic on the Meaningful Modelling of Epidemiological Data (MMED): 2-14 June 2014

This annual two-week modelling clinic, mounted in collaboration with the International Clinics on Infectious Disease Dynamics and Data (ICI3D) Program, and the African Institute for Mathematical Sciences (AIMS), will emphasize the use of data in understanding infectious disease dynamics. The Clinic will bring together graduate students, post-doctoral students and researchers from Africa and North America, with the goal of engaging the participants in epidemiological modelling projects that use real data to grapple with practical questions in a meaningful way.

Data Management & Visualisation in R: 23-27 June 2014

This intensive five-day course will take place at the Stellenbosch Institute for Advanced Study, taught by SACEMA staff. Targeted at postgraduate students and researchers, and open to anybody involved in data analysis, the course aims to develop competence and confidence in the management, exploration and visualisation of data, using the versatile, open-source statistical software package R.