



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

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SACEMA NEWSLETTER

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NEWS:

SACEMA launched a new software tool to maximise HIV prevention and treatment impact

A multidisciplinary team of scientists from South Africa, Europe and the United States developed a modelling platform, called SIMPACT, which can simulate the spread of HIV and estimate the impact and cost-effectiveness of various prevention and treatment interventions.

An overview of SIMPACT applications in South Africa was presented by SACEMA during a special session on 8 May at the Wallenberg Research Centre in Stellenbosch.

While hundreds of different purpose-specific models for HIV transmission, prevention and treatment have been developed over the past 25 years, SIMPACT avoids the need to build ad-hoc models from scratch every time researchers and decision-makers want to address a new research or policy question.

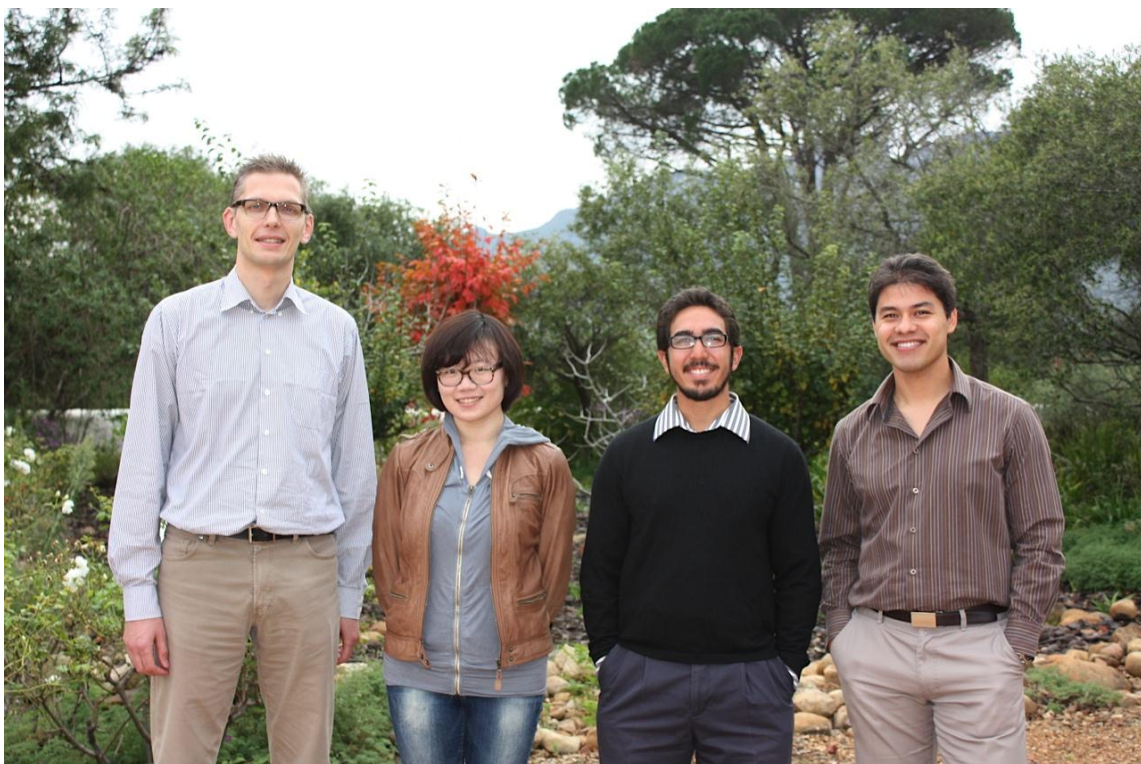
Prof Wim Delva, an epidemiologist at SACEMA and one of the team members, explains: "SIMPACT is an individual-based model for HIV transmission, prevention and treatment in a sexual network. An individual-based model can keep track of the history of events that happen to the individuals. Thus, it becomes possible to see exactly how many times an HIV-infected individual transmitted the virus by the end of his or her life, who became orphan due to Aids-related death of his or her parents and at what age, or how many lifetime sexual partners the average 35-year old man has had."

In SIMPACT, the complexity of HIV transmission and any prevention and treatment interventions that may be simulated is easily adjusted. Prof Delva explains: "In addition to defining the composition of the population in which the epidemic will take place, we can specify which events are possible in the simulation. By default, possible events include HIV transmission, relationship formation and dissolution, antenatal care visits, pregnancy and birth, and AIDS- and non-AIDS-related mortality, male circumcision, condom use, antiretroviral treatment initiation, and HIV counselling and testing."

After the simulations are run, the generated data are analysed and interpreted using health economic and network analyses. According to Prof Delva, SIMPACT allows researchers to combine several disciplines in the quest for effective and affordable measures to curb the on-going burden of HIV and AIDS, from social sciences and public health to statistics, computer science and health economics.

"We want to make this new tool available to policymakers, students and researchers who would like to work with us to shed light on complicated issues such as the cost-effectiveness of combination HIV prevention, the potential impact of universal, immediate access to HIV treatment, and the role of age-disparate relationships and labour migration in the spread of HIV in South Africa," he added.

Besides SACEMA, Prof Delva is also affiliated to the International Centre for Reproductive Health at Ghent University in Belgium. Other SIMPACT partners include researchers from the Centre for Statistics at Hasselt University and the Computational Epidemiology Group at the University of Iowa. The Flemish Interuniversity Council (VLIR), the Flemish Research Fund (FWO), the agency for Innovation by Science and Technology (IWT) and the Canadian International Development Agency (CIDA) funded the project. For large simulations, the infrastructure of the Flemish Supercomputer Center (VSC) is used, funded by the Hercules Foundation and the Flemish Government.



Niel Hens, Fei Meng, Lucio Tolentino and Wim Delva at the Simpack Launch in Stellenbosch, May 2013

Dr Guy Mahiane has been awarded the Docteur Norbert Marx Prix

SACEMA is proud to announce that Dr Guy Mahiane, who finished his postdoctoral research fellowship at SACEMA in October last year (currently at Johns Hopkins, USA), has been awarded the Docteur Norbert Marx Prix for his publication (co-authored by EP Nguéma, C Pretorius and B Auvert): “Mathematical models for coinfection by two sexually transmitted agents: the human immunodeficiency virus and herpes simplex virus type 2 case” in the Journal of the Royal Statistical Society Series C, 2010.



The Docteur Norbert MARX Prix is awarded every two years by the by the Société Française de Statistique (SFdS) to a French-speaking candidate, either French or foreigner, for their work in statistic methodologies in the fields of epidemiology, public health or health economics that has been published. The amount of the award is 4,000 euros.

2012/2013 Graduations

Congratulation to the following SACEMA-funded students who graduated in 2012/2013:



Chris Muller graduated with a PhD in Statistics from Stellenbosch University under the supervision of Prof Paul Mostert (Statistical Sciences). His dissertation was titled “Bayesian approaches of Markov models embedded in unbalanced panel data”.

Theresia Marijani graduated with a PhD in Mathematical Sciences from Stellenbosch University under the supervision of Prof Edward Lungu (University of Botswana). Her dissertation was titled “Mathematical modelling on interaction between malaria parasite and the host immune system”.



Joseph Ssebuliba also graduated with a PhD in Mathematical Sciences from Stellenbosch University under the supervision of Prof Edward Lungu (University of Botswana). His dissertation was titled “Mathematical Modelling for the Dynamics of Co-infection with HIV-1 and HHV-8”.

Edmore Marinda graduated with a PhD from the University of the Witwatersrand under the supervision of Dr Jonathan Levin (Wits University and MRC) and Prof Lawrence Moulton (Johns Hopkins School of Public Health. The title of his dissertation was "Understanding the BED Capture Enzyme Immunoassay (CEIA): Measuring HIV-1 incidence in cross-sectional studies".





Damian Kajunguri graduated with a PhD from Stellenbosch University under the supervision of Prof John Hargrove. His dissertation was titled “Modelling the control of tsetse and African trypanosomiasis through insecticide treated cattle in southeastern Uganda”.

Someya Essop graduated with an MSc from the University of Kwazulu Natal. Her thesis titled “Statistical Analysis of Data Specific to Genetic Epidemiology” was supervised by Prof Glenda Matthews.



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

SCIENTIFIC MEETINGS:

20th Conference on Retroviruses and Opportunistic Infections, 3-6 March 2013, Atlanta

Reshma Kassanjee and Alex Welte attended the CROI conference in Atlanta from 3-6 March 2013. Reshma presented their poster titled “The Performance of Candidate Assays to Detect Recent HIV Infection for Cross-Sectional Incidence Estimation: An Independent, Comparative Evaluation”.

6th International ICST Conference on Simulation Tools and Techniques: March 5-7, 2013, Cannes

Lucio Tolentino presented his combination prevention paper titled “A Simulation-based Method for Efficient Resource Allocation of Combination HIV Prevention” at the Simutools conference, held in Cannes from 5-7 March 2013.

Treatment as Prevention (TasP) Workshop, 22-25 April 2013, Vancouver, Canada

The 3rd International TasP Workshop was held in Vancouver during the week of the 22nd April 2013 under the leadership of Julio Montaner. It is well established as the primary meeting on Treatment-as-Prevention. Those who attended the conference were uniformly of the opinion that we have reached a tipping point and it's no longer an issue of whether, but how the strategy is going to be implemented. The first part of the job has been accomplished. The more difficult part is only now starting in that effectively and optimally implementing the strategy will remain a challenge for years to come. This is particularly the case given the limited resources that are currently available and being devoted to making immediate treatment available to all who want it. It was particularly encouraging to see the support for TasP from UNAIDS, UNITAID and PEPFAR. There is no doubt that we have the means at our disposal to keep people alive, to stop them infecting their partners and to stop transmission. We can achieve an AIDS Free generation if we have the political will and commitment from all sectors of society. The presentations that were made at the conference can be downloaded from the web-site at <http://www.treatmentaspreventionworkshop.org/>.

SACEMA researchers Brian Williams and Wim Delva participated in the workshop. Wim presented the modelling work done within the Maxart project titled "Modelling the potential impact of Treatment as Prevention in Swaziland".

EVENTS:

SACEMA Research Days Meeting, 19-20 March 2013

Our two-day annual "Research Days" meeting was held 19--20 March 2013, in the main auditorium of the Wallenberg Research Centre, for the first time -- a beautiful venue adjacent to SACEMA. Once again the event constituted a celebration of the extraordinarily wide range of interesting work being carried out by SACEMA-funded students throughout South Africa, under the able supervision of people from the many fields impinging on epidemiology. Eleven of the supervisors were present, including six who travelled from other universities; we are especially grateful to these people for their support and contribution to the overall mentoring at this meeting.

Over forty people took part, with twenty-four talks given by twelve MSc students, nine PhD students, and three senior researchers. Following the welcome by Prof Alex Welte, the meeting opened with a key-note talk by Prof Jacky Snoep, who, in the course of his talk on modelling glucose metabolism in malaria patients, stressed the importance of validation in modelling.

As usual, a high priority was given to informal interaction as well as the formal question-time after each talk. As is our practice, this verbal feedback has been complemented by emailed feedback on each student's presentation, collated from a number of mentors' notes, including suggestions for sharpening questions or new directions to explore. A new and valuable feature of the evaluation this year was a commissioned report by Dr Jo Barnes, whose comments on individual presentations from an epidemiologist's perspective have also been sent to all students and supervisors.

Participants were invited to a reception at SACEMA on Monday evening, when we welcomed newcomers and old friends alike. The conference dinner was held on the second evening in Decameron Restaurant, and the meeting concluded with a spit-braai on the final evening, at SACEMA.



Students, supervisors and staff at SACEMA Research Days, Stellenbosch, March 2013

SACEMA Seminars

The following seminars were held from February to May:

- 14 February: Joanna Lewis: Modelling CD4 Trajectories in HIV-infected Children Starting ART.
- 5 April: Profs Stephen Tollman, Kathleen Kahn & Samuel Clark from the MRC/Wits University Rural Public Health and Health Transitions Research Unit (Agincourt): “What’s going on – and what to do? Life-course research tackling complex transitions in rural Southern Africa”.
- 12 April: Simon Travers from the South African National Bioinformatics Institute (SANBI): Facilitating HIV drug resistance testing in an African context.
- 24 May: Paul Papenfus: Physical Activity and the Cost of Employment.
- 31 May: Mhairi Maskew: Bridging the gap: the epidemiologic study of cancer in the setting of the HIV epidemic.

UPCOMING EVENTS:

Clinic on the meaningful modelling of epidemiological data, 3 – 14 June 2013

SACEMA, in collaboration with the International Clinics on Infectious Disease Dynamics and Data (ICI3D) Program, and the African Institute for Mathematical Sciences (AIMS), will be holding the fourth annual Clinic on the Meaningful Modelling of Epidemiological Data. This two-week modelling clinic being held in Muizenberg from 3-14 June 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.

Topics in Biostatistics, 10 – 21 June 2013

This 10-day course, aimed at graduate students, researchers and health professionals will focus on advanced statistical methods for the analysis of data from medical and biological research. The course will be presented by a team of three from the Department of Statistical Sciences, University of Cape Town: A/Prof Francesca Little, A/Prof Sugnet Lubbe and Ms Katya Mauff. About 25 students have been selected, and a team of SACEMA students/researchers will provide tutor support for practical sessions.

Advanced Epidemiological Methods, 19 – 23 August 2013

Dr Matthew Fox of the Department of Epidemiology and the Center for Global Health and Development at Boston University will for the 4th year running be presenting this intensive five-day course on advanced epidemiological methods at Stellenbosch University. The aim is to deepen understanding of basic epidemiological concepts such as measures of effect, confounding, misclassification and selection bias, and to question the implications of various sources of bias. Says Matthew Fox: “Throughout the course we will focus on the core concepts of validity and precision and will further develop our understanding of these central ideas. We will emphasize the development of skills that every doctoral level epidemiologist should have, skills that are both practical and marketable.” The course is intensive and advanced, and a fairly solid background in statistics and epidemiology is a pre-requisite to get the most out of it. For more information and online application, go to www.sacema.com.