



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

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SACEMA NEWSLETTER

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NEWS:

ART initiation in Africa

When to start ART in Africa is a timely issue, especially now that the World Health Organization has launched new, consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. These stipulate that ART initiation is recommended in all individuals with a CD4+ cell count of 500 cells/mL or less (but giving priority to those with advanced clinical disease or a CD4+ cell count less than 350 cells/mL); and at any CD4+ cell count in those with active TB, Hepatitis B infection and severe chronic liver disease, in HIV-positive partners in serodiscordant couples, and in pregnant and breastfeeding women. We at SACEMA welcome the new WHO guidelines and see these as a key step in the direction of offering immediate treatment to all. It will now be up to individual countries (Governments, People Living with HIV and Civil Society) to make informed decisions about when to start treatment, taking into account the entire evidence base and human rights considerations. Whether such decisions should be primarily based on RCT data or the (perceived) lack thereof, is the topic of the following article.

An article, by SACEMA's Wim Delva with others, and published in the Journal of the International AIDS Society, reacts strongly to an opinion piece in which two leading scientists argue that an African RCT is urgently needed, in order to "definitively settle" the question of optimal timing of ART initiation in Africa. The authors of the Viewpoint article fundamentally disagree with this opinion and argue that inaction while waiting for the results of such a trial is unjustified. While not opposing their call for an African randomised controlled trial to better understand the health benefits and risks of

earlier ART initiation, Delva et al make the case for a fundamentally different approach to ART initiation in Africa, centred on the patient's right to decide when to start ART, in consultation with his or her health care providers, and guided by all scientific evidence, including that from past, ongoing and planned implementation studies.

Delva W, Yvette Fleming Y, Chingandu L. *When to start ART in Africa – primarily guided by RCTs or patient autonomy?* J Int AIDS Soc 2013;16:18756.

Link to full paper: <http://www.jiasociety.org/index.php/jias/article/view/18756>

Minister of Science and Technology pays site visit to SACEMA



On 5 September, National Minister of Science and Technology visited SACEMA to learn more about ongoing projects and the vision of the SACEMA team. He was accompanied by the department's Director of Health Innovation, Glaudina Loots, and Special Advisor to the Minister, Martin Mulcahy. The minister had previously attended the official launch of SACEMA, as deputy minister.

Philile Mlotshwa receives Women in Science Award



Philile Mlotshwa was awarded a Masters Fellowship at the Women in Science Awards for 2013. The event was hosted by the Department of Science and Technology (DST) in recognition and reward of the achievements of women scientists and researchers in South Africa. The fellowships awards were made to women under the age of 35 who are currently engaged in full-time research leading to a master's or doctoral degree. The awards recognise outstanding ability and potential in research and are meant to encourage young women to remain in research. Philile is one of three women who received the master's fellowship. Her research project, a collaborative project with CAPRISA in the area of tuberculosis and HIV co-infection, aims to investigate the effects of different HIV and TB therapies on the time to

hepatotoxicity for patients co-infected with HIV and TB. Link to the full article:

<http://mg.co.za/article/2013-08-23-00-emerging-researcher-violence-against-women>

Pepfar Project

SACEMA recently started a collaborative PEPFAR project with Dr Chris Desmond from the HSRC. This project is aimed at understanding the long-term outcomes for children 'affected' (as opposed to 'infected') by HIV and AIDS – in other words, children who live with family members who are infected, or potentially in communities with substantial HIV/AIDS related disruption. Phase 1 comprised a review of the evidence of immediate consequences for physical health, psychological and social outcomes. Phase 2 links the evidence on short-term consequences, identified in Phase 1, to long-term outcomes addressed in the broader (not HIV specific) child development and health literature. SACEMA is involved in the third phase, modelling some of the dominant long term pathways which emerged from the previous phases, to attempt to quantify the scale and dominant nature of some of the longer term impacts - at least within the most heavily affected countries identified within the PEPFAR programme. This will support priority setting within the 'orphans and vulnerable children' focus area of the PEPFAR programme.

Bursary call is out

SACEMA is once again inviting applications for bursaries to study towards MSc or PhD degrees in fields relating to epidemiology, biostatistics and epidemiological modelling. A background in quantitative methods is required, and interdisciplinary experience is welcome. Previous exposure to SACEMA's core research areas will be an advantage, and priority will be given to applicants demonstrating high motivation and affinities for the following areas in which SACEMA's current projects lie:

1. HIV incidence estimation methods.
2. Age-disparate relationships (age-mixing) and the sexual transmission of HIV.
3. TB, HIV, silicosis in mineworkers.
4. Antiretroviral treatment outcomes, particularly immunology and treatment resistance, and metabolic side effects of treatment.
5. Water access and water-borne diseases.
6. Spatial distribution of malaria.
7. Climate change and tsetse-borne trypanosomiasis.
8. TB transmission and reactivation.

See full announcement and online application forms at www.sacema.org. The deadline is 28 October 2013.

NEW FACES AT SACEMA:



Amanda October is the new SACEMA administrator. She joined SACEMA in June and is seated at Reception. Amanda holds a BSc degree from the University of the Western Cape and has several years of experience in the financial sector.

SCIENTIFIC MEETINGS:

SA AIDS and IAS

The 6th South African AIDS (SAAIDS) conference was held in Durban from 18-21 June 2013. SACEMA presented several posters and a number of talks. Alex Welte presented “HIV Incidence Estimation with Biomarkers: Key Concepts, and State of Play” in a session dedicated to new developments in measuring HIV incidence. Roxanne Beauclair presented findings of a qualitative study she performed that investigated the perceived risks of age-disparate relationships among women from three disadvantaged communities in Cape Town. The study suggests that in general women were not aware of the risks associated with dating older men, while dating a younger man is seen as a direct sentence to abuse and neglect. Fei Meng and Cari van Schalkwyk both presented modelling work in a session dedicated to incidence, prevalence and modelling. Fei’s model showed the simulated impact of different treatment strategies on HIV prevalence in South Africa. The results suggest that changing ART eligibility to higher CD4 levels and to stable sero-discordant couples have the best cost-effectiveness ratios and should be considered when universal access is unfeasible. Cari presented the model that has been developed by Wim Delva and MaxART partners that will be used to inform an implementation study in Swaziland. The model allows us to compare the impact on e.g. incidence at different CD4 count thresholds for ART initiation, ranging from the current threshold of 350 cells/ μ L to ART eligibility irrespective of CD4 cell count. This same model was presented by Alex Welte at the 7th International AIDS Society’s conference on HIV pathogenesis, treatment and prevention (IAS), held in Kuala Lumpur, Malaysia from 30 June to 3 July 2013.

A notably interesting session at IAS was entitled “New Approaches to Assess the Population Level Impact of New Prevention Technologies”. The concern has often been raised that the near impossibility of treating people during the early stage of ‘acute infection’ – when they are highly infectious – poses a severe obstacle to the prevention benefits that can accrue from treatment. The limitations of the naïve view of this effect have been discussed amongst modellers, but the ideas are far from mainstream. Preliminary work shown in this session, from extensive scenario modelling, supports the view that the prevention impact of treatment is relatively insensitive to assumptions about the fraction of new infections which arise from ‘acute infection’ index cases.

The 2013 WHO Consolidated Guidelines on ARVs were launched at IAS. The new Guidelines recommend a move towards the use of viral load monitoring for diagnosing ARV therapy failure. Medecins Sans Frontieres (MSF) hosted a satellite session focused on the feasibility and affordability of viral load scale-up. Dan Keebler presented the results of the HIV Modelling Consortium in this session. The Consortium, of which SACEMA is the second hub, was contracted by the WHO to assess the impact and cost-effectiveness of viral load monitoring versus clinical and CD4 monitoring strategies. Drawing together three mathematical models and twenty co-authors, the work found that while viral load provides the most benefit to individuals, at population level this benefit comes at a much higher cost than the benefits of CD4 or clinical monitoring, and that devoting resources to ART scale-up rather than viral load monitoring brings greater gains in population health. To maximize the benefit of viral load monitoring, it is imperative that advocates and others in public health continue to work aggressively to bring down costs in years to come.

EVENTS:



Clinic on the Meaningful Modelling of Epidemiological Data, 3-14 June, Muizenberg

The fourth annual **Clinic on the Meaningful Modelling of Epidemiological Data** was held in Muizenberg from 3-14 June 2013. This 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), emphasized the use of data in understanding infectious disease dynamics. The Clinic brought 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, Stellenbosch

The 10-day course **Topics in Biostatistics**, took place 10-21 June 2013, with 17 participants (4 from SACEMA) representing a variety of universities and institutions in South Africa, and from 9 different countries. Aiming to address the need for capacity building in this important field, this is the third year a biostatistics short course has been mounted, in association with the University of Ghent, Belgium and funded by the Flemish Inter-University Council (VLIR). The presenters this year were Prof Francesca Little, Ms Katya Mauff, Prof Sugnet Lubbe, all from the Department of Statistical Sciences, University of Cape Town. They were backed up by tutors from SACEMA: Cari Van Schalkwyk, Hilmarie Brand, Roxanne Beauclair, Renier van Rooyen, Wim Delva, and Fei Meng.



Advanced Epidemiological Methods Seminar, 19-23 August, Stellenbosch

The fourth edition of **Advanced Epidemiological Methods**, 19-23 August, presented by Prof Matthew Fox of the University of Boston, was sponsored jointly by SACEMA and the Health Economics and Epidemiology Research Office (HE²RO), under the WITS Health Consortium. The five-day seminar took place in Stellenbosch, with 11 participants, including people from various institutions in South Africa, and from a number of other countries.

This thought-provoking course aims to sharpen the skills of trained epidemiologists by deepening their understanding of basic epidemiological concepts such as measures of effect, confounding, misclassification and selection bias, and challenging participants to question the implications of various sources of bias.

It is hoped to offer in 2014 another cutting-edge course by Matthew Fox: **Applying Quantitative Bias Analysis to Epidemiologic Data**. This course enables epidemiologists to go beyond diagnosis of bias and answer the "So what now?" question, by finding estimates of its importance and possible solutions. Participants learn how to conduct simple and probabilistic bias analyses (introducing appropriate software), and to use these to account for systematic as well as random error in estimates of effect.

SACEMA Seminars

The following seminars have been held since June :

- 20th August: Dr Chris Desmond (Human Sciences Research Council): *Consequences of HIV and AIDS for affected children; and Predicting long-term outcomes for children affected by HIV and AIDS.*
- 13th September: Cuc Tran (PhD Student at the Department of Environmental & Global Health, Training Fellow at the Clinical & Translational Science Institute and Research Associate at the Emerging Pathogens Institute, University of Florida): *Translating Mathematical Models into Public Health Practice: The Control Flu School-located Influenza Vaccination Program.*

UPCOMING EVENTS:

MSC Defence: Faikah Bruce: 18 October 2013, 12h00-13h00, at SACEMA

Title: Understanding the Impact of an HIV Intervention Package for Adolescents.

Seminar: Leigh Johnson (UCT): 18 October 2013, 1400-1500, at SACEMA

Title: Progress towards preventing and treating HIV in South Africa: insights from mathematical modelling.

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



Presenter: Dr Dimitris Rizopoulos (Department of Biostatistics, Erasmus University Medical Center, the Netherlands).

Bayesian Biostatistics, 4-8 November 2013, at SACEMA.



Presenter: Prof Emmanuel Lesaffre (Department of Biostatistics, Erasmus University Medical Center, Rotterdam, the Netherlands, and Catholic University of Leuven, Belgium).

Clinic on Dynamical Approaches to Infectious Disease Data (DAIDD), 16-20 December 2013, Gainesville, Florida.

Faculty will include John Hargrove, Brian Williams and Gavin Hitchcock. Several African student participants (including SACEMA's Cari van Schalkwyk) have been selected to participate, together with American students, in this sister Clinic to the Meaningful Modelling of Epidemiological Data (MMED).