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Title: Mathematics and HIV: Operations Research and Network Modelling for HIV Treatment and Prevention

Event Type: Conference-Workshop

Location:

The workshop was held at the IRMACS Centre of Simon Fraser University, Burnaby, British Columbia, Canada

Dates:

March 29-30, 2014

Topic:

Operations research utilizes a variety of mathematical modeling techniques to improve workflows, procedures and operations within organizations or programs, and to guide planning and management decisions. // Among countless applications, network models have been used to study epidemics of infectious disease. // Network modeling and operations research are often applied independently to questions related to the HIV epidemic. However, the intersection of these fields is an emerging area of research. // This workshop explored approaches combining network modeling and operations research to applications in HIV epidemiology – particularly to the ongoing Treatment as Prevention (TasP) effort. //

Methodology:

The first day included (1) plenary lectures, (2) an oral poster session with 5 minute presentations of posters which were displayed throughout the workshop, and (3) a panel discussion with the plenary lecturers at the end of the day. // The second day began with three technical lectures on the NependiX network modelling software package, developed by our group. // This was followed by a hands on tutorial session, where participants developed and ran a network model of the HIV epidemic. // Results from each participant were amalgamated by the tutorial instructor and were discussed by the group in a final wrap-up session. //

Objectives Achieved:

The workshop outlined directions and methodology for using network models in operational models of interventions using HIV treatment and other methods to contain the HIV epidemic or to drive it toward elimination. // Network structure is crucial to the spread of HIV but also to the successful dissemination of interventions, such as a testing strategy. // The tutorial problem was a novel idea, whereby HIV testing spread on a network as an infection. // This "testing bug" problem is currently under further study. //

Scientific Highlights:

The workshop may have been the first event that explicitly focused on combining network modelling

and operations research. // There have been numerous fruitful and dynamic discussions and plans made for future joint research. // A large number of participants requested a follow up to this event. // It was felt that a regular event would be important to continue the discussion on what is an important and timely topic. // There are at least two concrete collaborations that have been launched as a direct outcome of the workshop. // Dr. Brian Williams from SACEMA, South Africa and the WHO and our group at IRMACS (including A.R. Rutherford, L. Ahrenberg, K. Vasarhelyi, S. Kok) have initiated a network modelling simulation project to study the dissemination of a HIV testing and treatment program for miners and sex workers in South Africa. // A visit to South Africa has been planned for members of our IMPACT-HIV group (who hosted the workshop) for the fall of 2014 to complete the analysis and the publication that has been initiated at the workshop on this topic. // Prof. Margaret Brandeau from Stanford University and Dr. Brian Williams also started another collaboration with members from our group (A.R. Rutherford and K. Vasarhelyi) to build an operations research framework for scaling up access to HIV treatment globally in order to stem the spread of the virus through what is called the "Treatment as Prevention" strategy). // An abstract on this topic was submitted to 2014 Operations Research Applied to Health Services (ORAHS) meeting, to be held from July 20-25, 2014 in Lisbon, Portugal, and it was accepted for an oral presentation. This new research project is the direct results of the workshop. // The tutorial problem on the "HIV testing bug" was also accepted for an oral presentation at ORAHS 2014. //

Organizers:

Vasarhelyi, Krisztina, IRMACS, Simon Fraser University // Rutherford, Alexander, IRMACS, Simon Fraser University // Borghardt, Pam, IRMACS, Simon Fraser University // Jungic, Veselin, IRMACS, Simon Fraser University // Kok, Sarah, IRMACS, Simon Fraser University //

Speakers:

The full list of speakers, affiliations, titles and abstracts for talks is in the attached pdf file.

Links:

<http://impact-hiv.irmacs.sfu.ca/math-hiv-workshop/home>

File Uploads:

Additional Upload 1:

http://www.pims.math.ca/files/final_report/Mathematics_and_HIV_Workshop.pdf
