SAID BUSINESS SCHOOL, University of Oxford

SEMINAR SERIES / HILARY 2011

Convenors: Felix Reed-Tsochas, Institute for Science, Innovation and Society, Saïd Business School
Eduardo López, Saïd Business School

Sandwiches and drinks will be provided

Please note: although the seminar programme detailed was correct at time of printing, seminar arrangements are subject to change – for the latest information, please check the seminar webpage.

Tuesday 8th March
(12.30pm – 2.00pm) James Martin Seminar Room

Dr Thomas House
Research Fellow, Warwick Mathematics Institute, University of Warwick

'Coughs and sneezes spread diseases (across a complex network)'

ABSTRACT

The contacts between humans that are capable of spreading infection are most naturally conceptualised as a contact network. Historically, this was a highly spatial graph, with pre-industrial epidemics like the black death spreading diffusively through Europe. By contrast, modern outbreaks like SARS or swine 'flu can cross continents overnight due to the 'small world' nature of modern contact patterns. While theoretical work suggests that different contact network structures should have radically different epidemiology, three major challenges remain: firstly, there is the question of how to parameterise and measure the contact network relevant for a given pathogen; secondly, there is the question of how to model the infectious process on a massive, complex network; and finally, there is the question of how the extrinsic risks quantified by the contact network correlate with intrinsic risks like age and immunological status. I will discuss different approaches to these problems, including (respectively): contact surveys; moment closure; and data-intensive bespoke models. For further background see the recent review by our group at Warwick, arXiv:1011.5950.