

## Wise use of mathematical models in policy

By *Erika Mansnerus and Tony Barnett*

Mathematical models are used widely, in economic forecasting, in the social sciences more generally, climate research and work on infectious diseases. But what do the social sciences have to say about modelling and what can modellers learn from the social sciences?

A recent conference at the British Academy (17-18 May 2012) convened by **Erika Mansnerus** and **Tony Barnett** looked at Modelling for Policy. 120 participants from academia, government and industry, and 12 distinguished speakers, explored the realities of model use and construction in what turned out to be a hugely successful and exciting couple of days. Speakers included:

- Nigel Gibbens, the UK's Chief Veterinary Officer
- Angus Nicol, Influenza Co-ordinator for the *European Centre for Disease Prevention and Control*
- Angela McLean, Professor of Bio-Mathematics at Oxford and Charlotte Watts, Sigrid Rausing Professor in Gender, Violence and Health and Head of the Social and Mathematical Epidemiology Group at LSHTM
- Melissa Leach, Professor of Social Anthropology and Director of the STEPS Centre at the University of Sussex.

A key concern shared widely by participants was that mathematical models of infectious diseases often seem to be very crude, ignoring social dynamics and behavioural patterns. The reason is partly practical: behavioural data are difficult to collect, quantify and include in models. Yet, in order to build credible models of HIV/AIDS transmission among sex workers, Prof. Watts and her research group have taken steps to integrate social research data into their models. This increases the model complexity but gives a more realistic account of transmission patterns in such situations. However, all social scientific evidence cannot or should not be integrated into models. Anthropological studies provide evidence that cannot be reduced to numbers or model estimates but yet provide integral knowledge of the context and social relations in which model-based interventions will be implemented. It also suggests that “actor models” should play a role as inputs into mathematical model. Heterogeneity of evidence when taken into account in decision-making process is vital. Model-based evidence is one of the many sources of evidence that can effectively inform us of infectious outbreaks, but needs to be used wisely. A very important point which arose in discussions was that construction of models, their use and the use of their results might need to be considered by ethics committees.

For further information about the Conference visit the **British Academy** website.

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