



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■

The impact of disease outbreaks: some dangers of modelling

Professor Tony Barnett

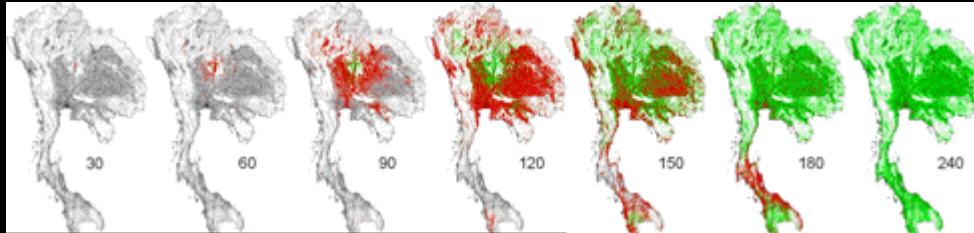
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&

London School of Hygiene and Tropical Medicine



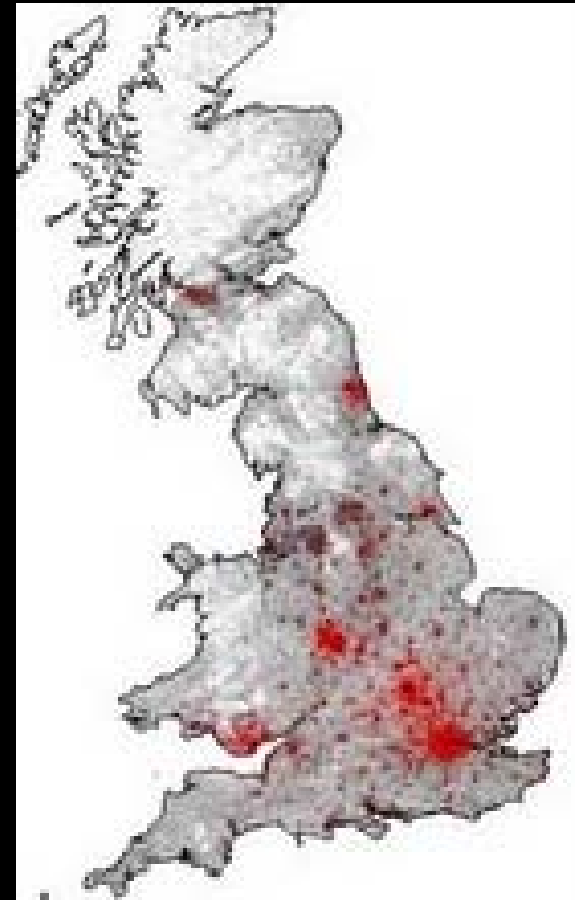
The Magic of Modelling



- data availability
- affordable high-performance computing
- mathematical models of infectious disease spread offer potential to provide predictive quantitative analyses of alternative disease control and treatment strategies.

$$\frac{dy_i}{dt} = \lambda_i \sum_{j=0, \dots, (N_L-1)} (s_i^{(j)} - s_i^{(j+1)}) (1 - \gamma(j+1)) - \sigma y_i$$

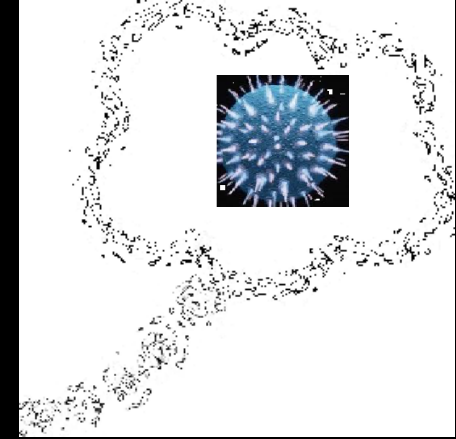
+ SMT,



PEOPLE THINK, TALK & REFLECT



THINKING, TALKING AND
REFLECTION BECOME PART
OF THE EPIDEMIC EVENT



And models have a social life...

- Erika Mansnerus
- Using Models to Keep Us Healthy: Productive Journeys of Facts across Public Health Research Networks” in
- M. Morgan and P. Howlett (eds.): *How Well Do ‘Facts’ Travel?* Cambridge University Press: Cambridge, 2011.
- <http://www2.lse.ac.uk/researchAndExpertise/Experts/profile.aspx?KeyValue=e.mansnerus@lse.ac.uk>

Models and Agents

*“We don’t know for sure, but the models assume ...”
was not an acceptable answer..’*

Erika Mansnerus, London School of Economics

- MODELS
- Model assumptions, parameterization and estimates
- Data sources and proxies
- AGENTS
- ministers and public spokespersons
- The public
- The media

“Mathematical models are useful for predicting how outbreaks will spread, but in order to make the models accurate, we need to supply them with data about how disease spreads in the real world.”

Simon Cauchemez, Imperial College, London

OUTPUTS

- Modelled predictions and scenarios
- Who owns them?
- Who should own them?
- When: at what stage(s) of an epidemic event?

- Public fear
- Sensationalist media
- What to do about this situation?
- How to communicate uncertainty and probability?



General Population & Media

- Basics of epidemiology as part of public health education programmes
- Limits of modelling: assumptions, proxies and confidence limits
- Would this be *real* transparency?

Clinicians, other specialists and human behaviour

- clinicians as “the experts” are not always the experts they think they are about human behaviour

SARS, STRESS AND A STORY OF TWO GROUPS

- POSITIVES: Problem-focused coping, higher adoption of precautionary measures
- NEGATIVES: emotion-focused coping may lead to distancing from other people and stigmatization of those who are seen as behaving in socially undesirable ways.
- *In such circumstances, the role of the media and articulation between the media and authorities become critical if problem solving coping responses are to be maintained at the highest possible levels.*

POPULATION
GROUP

Emotional
orientation

Problem
orientation

EARLY
STAGE

People
overestimate
risk

WORRY

SEEK
PRACTICAL
SOLUTIONS

MID STAGE

PEOPLE SEEK
CLEAR
UNAMBIGUOUS
MESSAGES



CONSPIRACY
THEORIES

RUMOUR, CONSPIRACY AND FOLK THEORIES

- AT THIS STAGE PEOPLE ARE MOST LIKELY TO DEVELOP AND ATTEND TO CONSPIRACY THEORIES
- THIS IS THE STAGE AT WHICH CLARITY IS REQUIRED
- EMERGENCY PLANNERS AND OTHER EXPERTS MAY REFER TO MODELS AT THIS STAGE

The Myth of “Openness”

- In fact we know surprisingly little about how people respond to epidemic events –
- In the absence of such knowledge and with a sensationalist press, some departments of some governments may appear paranoid about communicating with the public
-while at the same time claiming “openness”.

And finally

- We need to take account of modelling and the pharmaceutical industry
- Modelling outputs can be valuable commercial products
- They may influence profits and markets
- For example: pre-ordering of Tamiflu

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