

Models for management decisions – white elephant or an elephant in the room

The bilateral “issues” arising, when risk modelling and decision support interact (e.g. through risk assessment) are well acknowledged and manifold statements exist how this could be a constructive process of cross-fertilization towards satisfying the needs. Nevertheless, practical experience may often remind the white elephant, something value-laden and costly that the receiver cannot get rid of, or the elephant in the room, something solving at hand but not recognised at all. Maybe nobody knows for sure how to avoid either or of these creatures – but they exist. Using famous historic examples from Animal Health I want to make them lively and bring up some feeding thoughts from literature.

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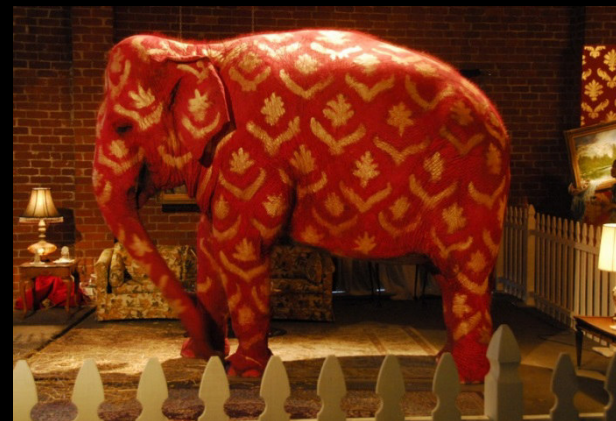
Models for management decisions - white elephant or an elephant in the room?



Wikipedia – public domain

A **white elephant** is a possession which its owner cannot dispose of and whose cost of maintenance, is out of proportion to its usefulness.

The **elephant in the room** is something you do overlook although apparently impossible



Wikipedia – Wyatt, Edward. A Splashy Los Angeles Debut by Banksy - Design - New York Times, 16.9.2006.

Acknowledgement

YOU!



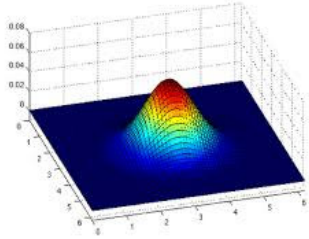
EFSA/EPPO Joint Workshop

Modelling in Plant Health

12-14 December 2016

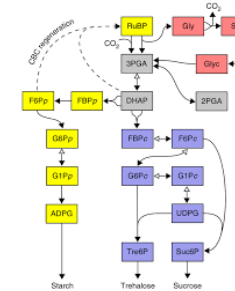
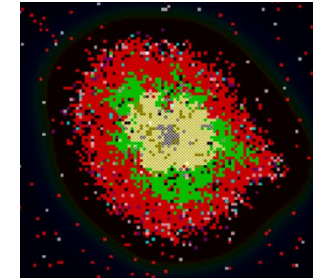
EFSA premises, Parma, Italy

- Keep it simple - so it is not rocket science.
- Should predicting <> not following-up.
- Seek very robust evidence.
- Managing different interests!
- “Validation” of models by experts (credibility)
- Management does not want to pay for their support.
- Can models for decision be validated?
- The wish to have one model fits all.
- Can we benefit from theoretical modelling?
- How to cope with inevitable uncertainty of model predictions?
- “What do you think?” RM→RA; RA→RM
- Framework for model testing
- Trade-off diagrams as reflection of scientific support accessible based on managers input
- Quantify uncertainty with more elaborated modelling!
- Modelling as tool in decision making
- No model without data? Deficiencies in data.
- Model means simplifications – which appears not ideal for good decisions
- How often do managerial decisions fails? How often models did fail
- What ways to present and communicate uncertainty?
- Temporal dimension of predictions
- Reliability of individual models unknown (prior to decision made) run ensemble modelling
- The correct model issue
- The trial and fail issue to gain time



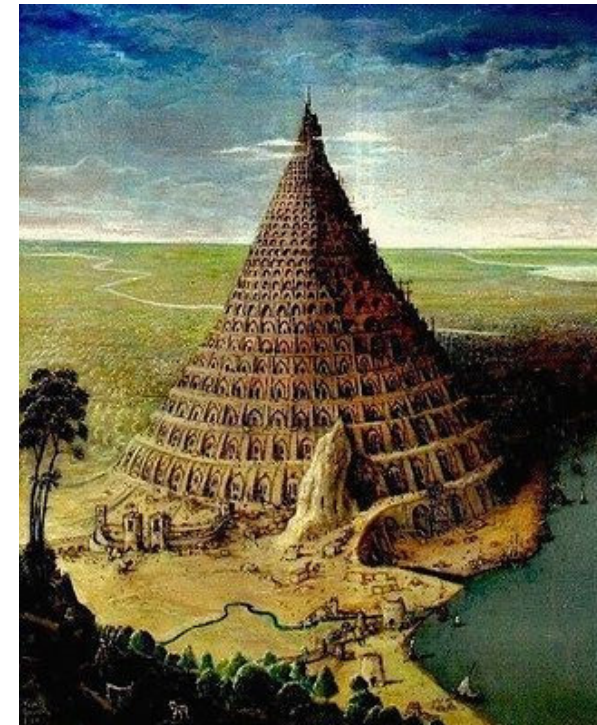
$$\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$$

Prologue



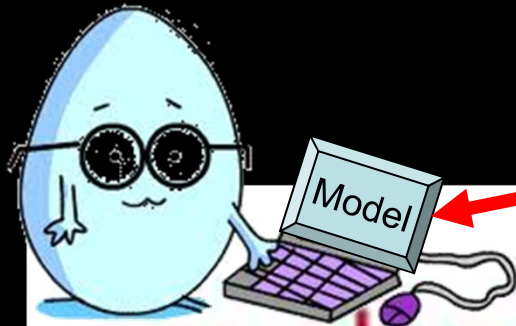
“Explicit”

- ~~Models <> Decision~~
- Modell**ing**
<> Decision mak**ing**



The Tower of Babel (2012) CC-BY-SA (3.0) by Paul Gosselin

Babel...



y duz no1 listn 2 me

:(



On motivation

Modellinging <> Decision makinging

- Request to
 - facilitate benefit to the society from the opportunities modelling offers (if needed)
 - prevent subjecting the society to disastrous or purposeless decisions made due to model's input
- Relationship?

“Explicit models”

On tasks

- No need for, if no need!
- A need setting tasks, incurs effort. Outcome must be considered.

Modelling <> Decision making

- Gaps towards a decision do – in practice – seldom correspond with ongoing science!
- Scientific curiosity <> Mandated task

On money

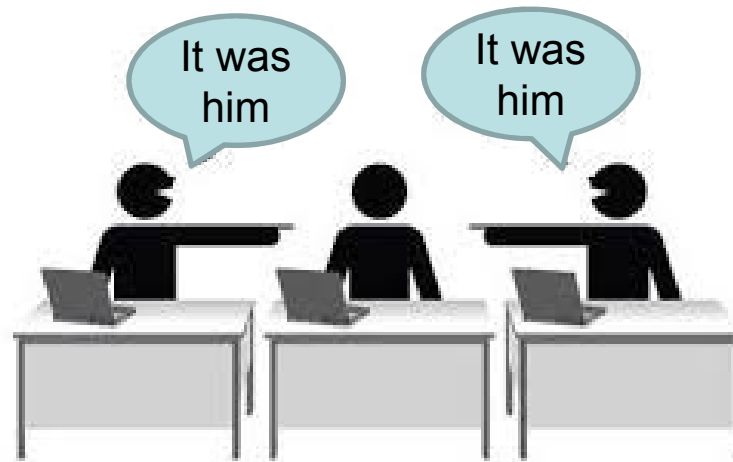
- Modelling for decision support cannot come without cost.
- „customer” + „supplier” relationship.
- Budget according to the „costumer's” benefit judgement.

Modelling & Decision making

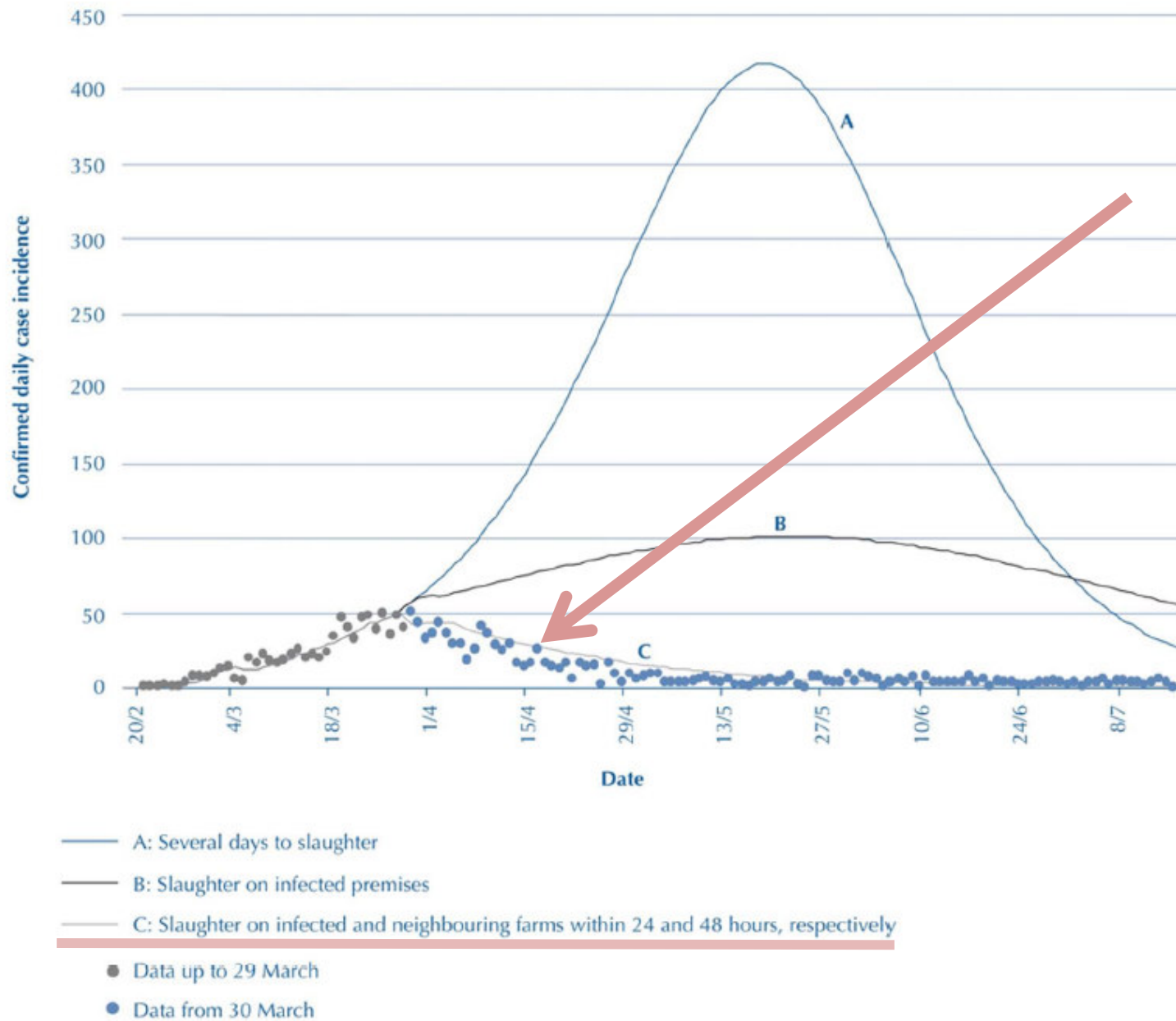
On failure

- Are we prepared to fail?
- Who is we?

Modelling & Decision making



37 The Imperial College team's epidemiological model predictions of 29 March 2001 and a comparison with the actual path of the epidemic



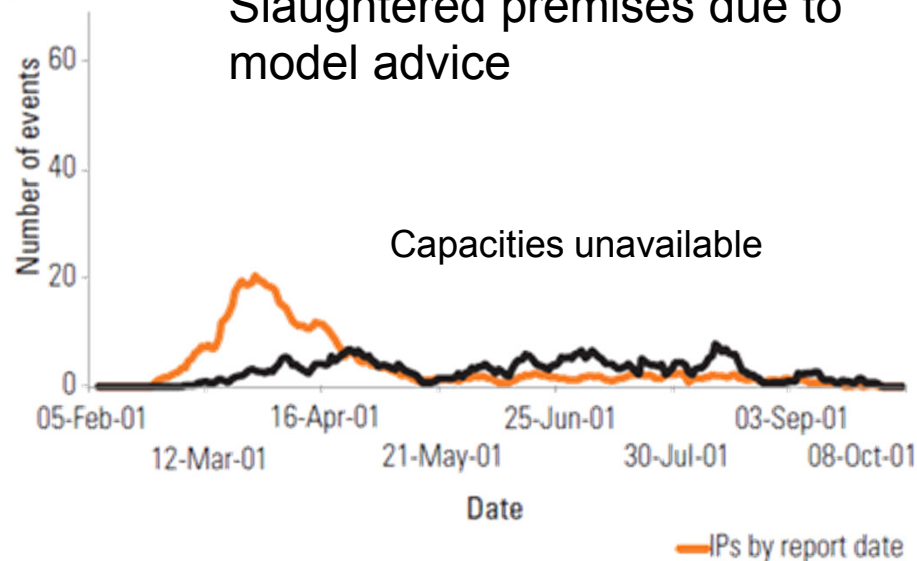
Christley et al. (2013). "Wrong, but useful": negotiating uncertainty in infectious disease modelling. PloS One, 8(10), e76277. <http://doi.org/10.1371/journal.pone.0076277>

Mansley et al. (2011). Destructive tension: mathematics versus experience – the progress and control of the 2001 foot and mouth disease epidemic in Great Britain. Rev Sci et Tech 30, 483–498.

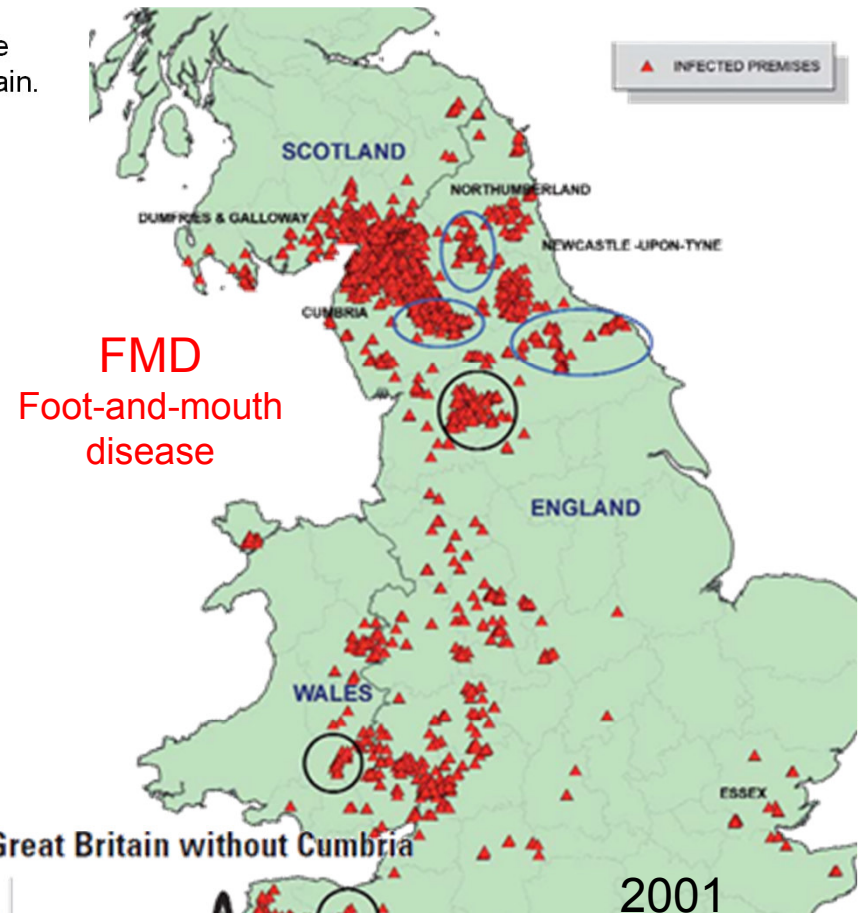
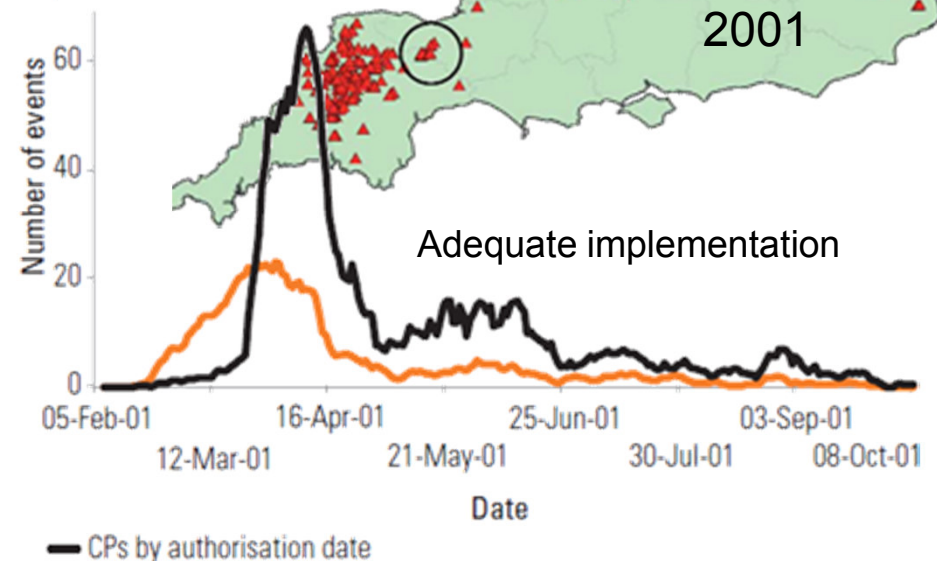
Controlled decision trial

Infected premises

a) Cumbria



b) Great Britain without Cumbria



The key question for any model is whether decisions made with it are more correct than those made without it.

Kitching et al. (2006). Use and abuse of mathematical models: an illustration from the 2001 foot and mouth disease epidemic in the United Kingdom. Rev Sci Tech, 25(1), 293–311.

On failure

- We are not prepared to fail.

- Who is we?



Modelling & Decision making

- The rate of management decisions failing is inaccessible?
 - When does a decision fail?
 - What is the proportion involving model outcome?

On assurance

Modelling & Decision making

- Pivotal to evaluate model suitability
 - C: Protocols/tick-lists for Decision Making to **evaluate models** from the credibility point of view.
 - S: Protocols/tick-lists for Modelling to **document model** structure, analysis AND uncertainty transparently and standardised.

Epilogue



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