

Defra's Quantitative Modelling Strategy

Purpose, Scope and Approach



The quantitative modelling strategy is a project within the Epidemiology Group programme of work in Defra, led by Jane Gibbens. Modelling work is coordinated by Francesca Culver with Giles Paiba (Lead Epidemiologist) leading the intelligent customer function. Daniel Adikpe and Jodie Crabb provide scientific and project management support, respectively.

Purpose: Why do we need a Modelling Strategy in Defra?

Quantitative modelling (QM) employs a range of mathematical and statistical techniques to analyse data so as to test hypotheses, evaluate risk, provide predictions of disease spread and the effect of different control measures and provide resource and economic impact assessment of disease. It is especially important for providing scientific evidence to aid policy decisions in the design of contingency plans and for effective outbreak control.



Scope: Current and future objectives

Defra has invested significantly in modelling capability since 2001 and the Modelling Business Group led by Francesca Culver was set up in 2009.

- We are exploring the potential for establishing a 'standing capacity' to provide reactive modelling in the event of an outbreak of FMD and for outbreak related work (including preparedness) and ad hoc modelling for policy development.
- We are seeking to improve use/ access to epidemiology in both policy development and disease control by building relations with delivery agents Animal Health and Veterinary Laboratories Agency.
- We are seeking to develop a standard approach for modelling reports to ensure that assumptions and key data dependencies are transparent – this is particularly important when using data from an outbreak as changes in policy during the outbreak can change the meaning of the data.

Ad Hoc Modelling: Providing evidence for policy

Our 'ad hoc' modelling capacity provides short term modelling capability to support policy activities and is formed of a cadre of experienced modellers who would be able to develop or extend models as part of small pieces of commissioned modelling work. There are currently a number of individual contracts in place with a small number of organisations to enable the rapid commission of ad hoc modelling.

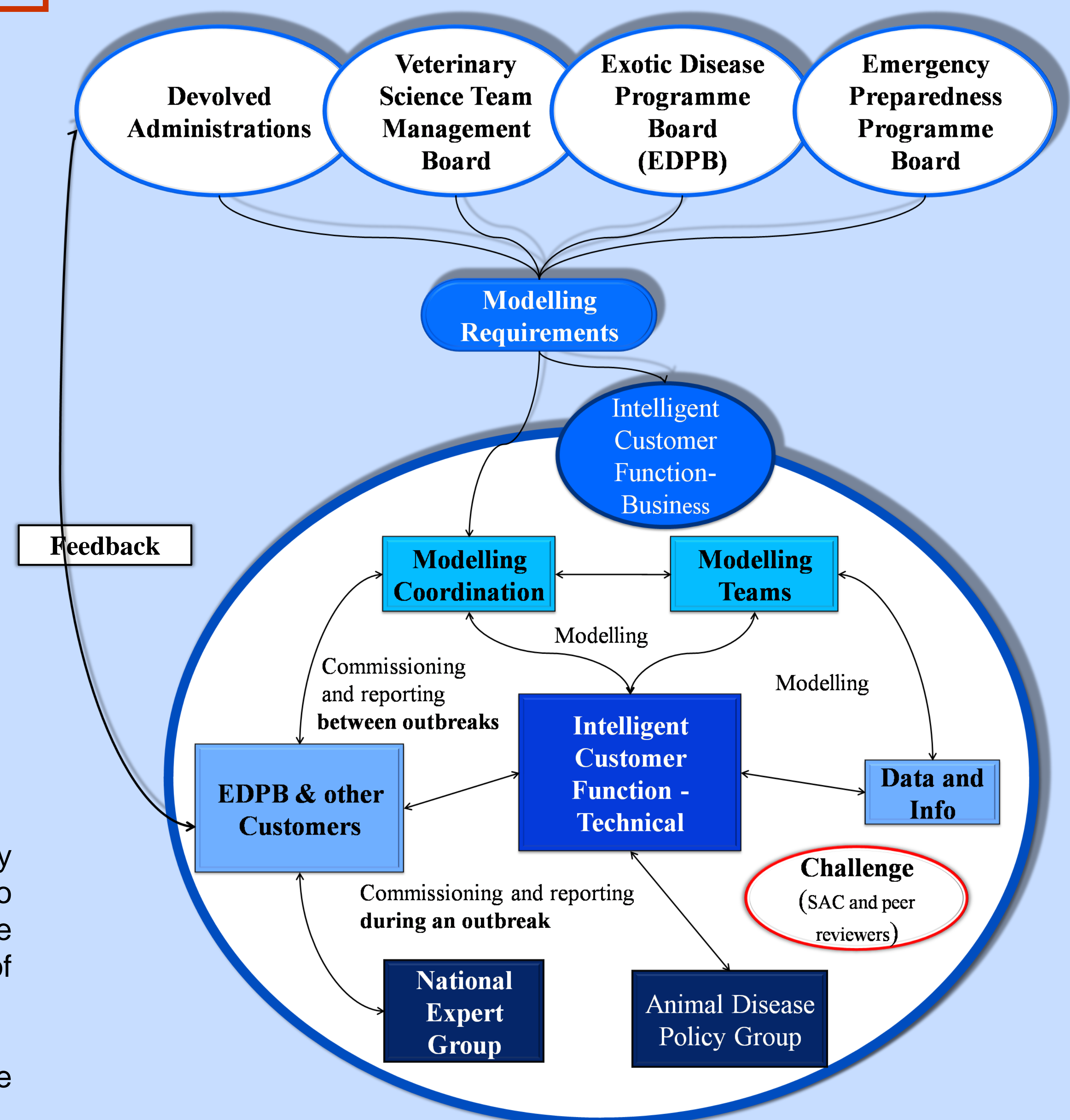
Applied modelling requests have so far been received to Improve the scientific evidence base relating to:

- Single Occupancy Authorities,
- Bluetongue
- Equine exotic diseases.

Intelligent Customer Function

Two Intelligent Customer Function (ICF) groups drawn from Defra staff support modelling. These are the ICF – Business (ICF-B) and ICF – Technical (ICF-T). Both fulfil the typical role of an ICF, ensuring that the business or technical requirements respectively are correctly specified, the work is supervised, and the outputs are reviewed to ensure they are fit for purpose.

The ICF-T provides an important component in the quality assurance of modelling outputs and is formed of 4 people – a mathematical modeller, a veterinary epidemiologist, an economist and a resources/logistics manager. Further QA is provided by formal peer review of models and engagement with colleagues internationally to explore and agree best practice. Defra's Epidemiology Group also works with Defra's Science Advisory Council's (SAC) subgroup on modelling, risk and prediction; current work is directed towards improving our process of scrutiny and challenge of modelling outputs as part of the quality assurance processes.



Standing Capacity: Improving outbreak preparedness

A procurement process has just started to explore the potential to establish a QM modelling group who are able to provide the capacity to run a range of models covering different species and types of models e.g. network analysis, economic modelling or producing model outputs which can provide input to other models (e.g. economic analyses). The requirements for this tender are currently being scoped.

The group established by this tender process is intended to provide experienced modelling capacity, to work as part of a team with the NEEG (National Emergency Epidemiology Group) and feeding results into the Animal Disease Policy Group (ADPG) and NDCC (the National Disease Control Centre) during outbreaks, and so may be called upon at short notice. Establishment of such a group and its maintenance between outbreaks will enable the participants to develop familiarity with GB data and agricultural practices, and to engage with Defra's regular review of the diseases and risk factors covered to maintain currency of modelling activities and capability.

