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Impact from applying innovation and optimising global funding in support of research and innovation.

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Overview

1. Harnessing modelling in support of FMD control
2. Applying new approaches to knowledge transfer
3. Maintaining and making best use of global funding in support of research and innovation



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UK experience of modelling in support of FMD control





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FMD modelling in 2001

2001: Models

- Three models were used to predict the spread and control of the 2001 FMD epidemic
- Developed prior to outbreak
 - InterSpread model (Morris *et al.* 2001)
- Developed during outbreak
 - Cambridge-Edinburgh model (Keeling *et al.* 2001)
 - Imperial model (Ferguson *et al.* 2001)

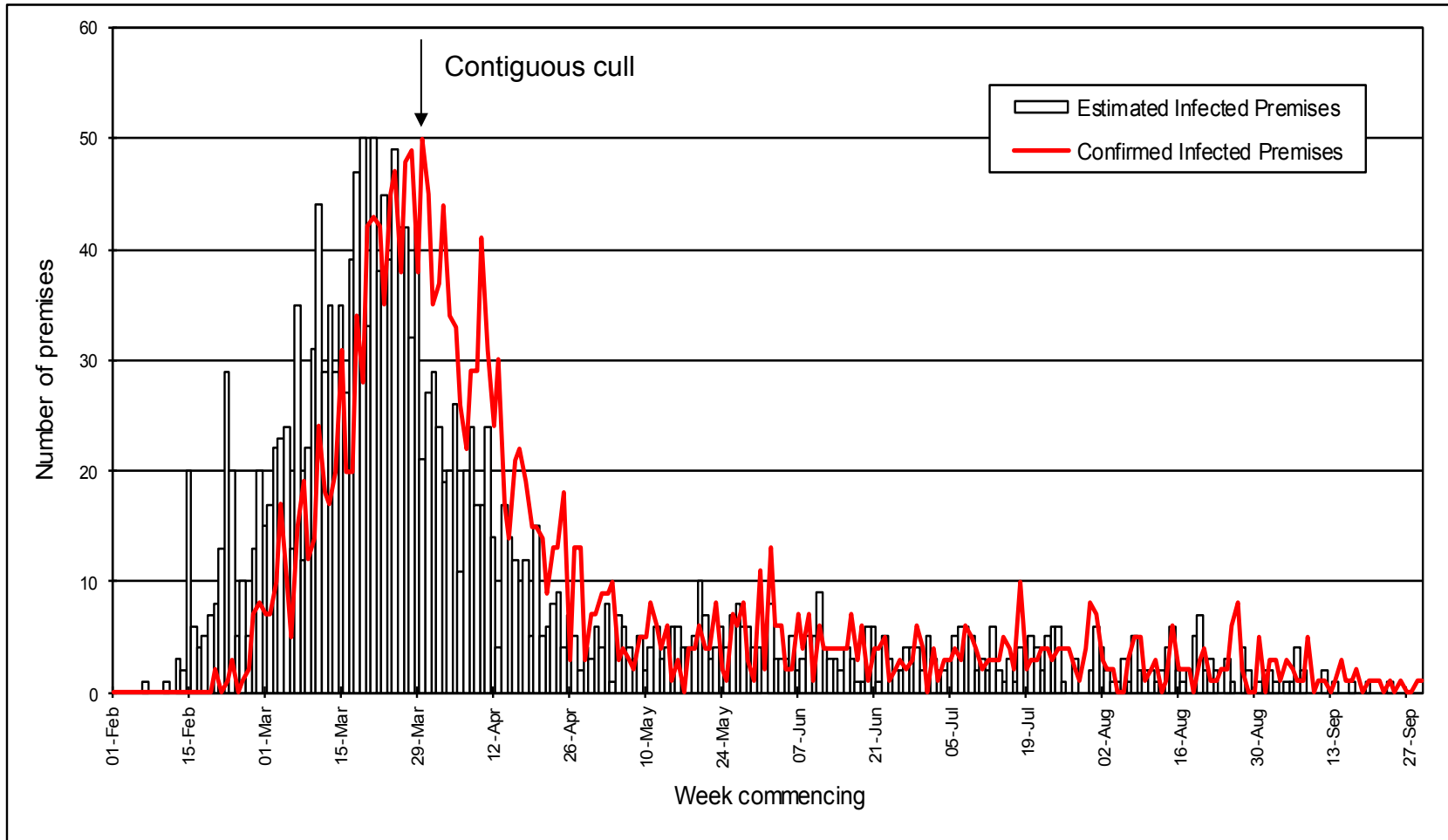
2001: What worked well

- **Model ready for use** – InterSpread model developed in peacetime and available for use by MAFF
- **Good collaboration** – MAFF & NZ InterSpread modelling group
- **Run-time and delivery of outputs** – delivered to MAFF by following morning
- **Modelling led to targeted control** – identification of the unusual and unexpected helped to better target controls

2001: What didn't work well

- **Internal capability** – no internal modelling capability existed within MAFF
- **Engagement** – limited engagement between MAFF and external modellers in peacetime
- **Data** – access to demographic data and understanding of case and clinical data
- **Costs** – costs associated with control options were not fully explored by modelling
- **Challenge function** – limited challenge function to external modelling by internal government officials involved in outbreak control

FMD UK 2001: the epidemic curve





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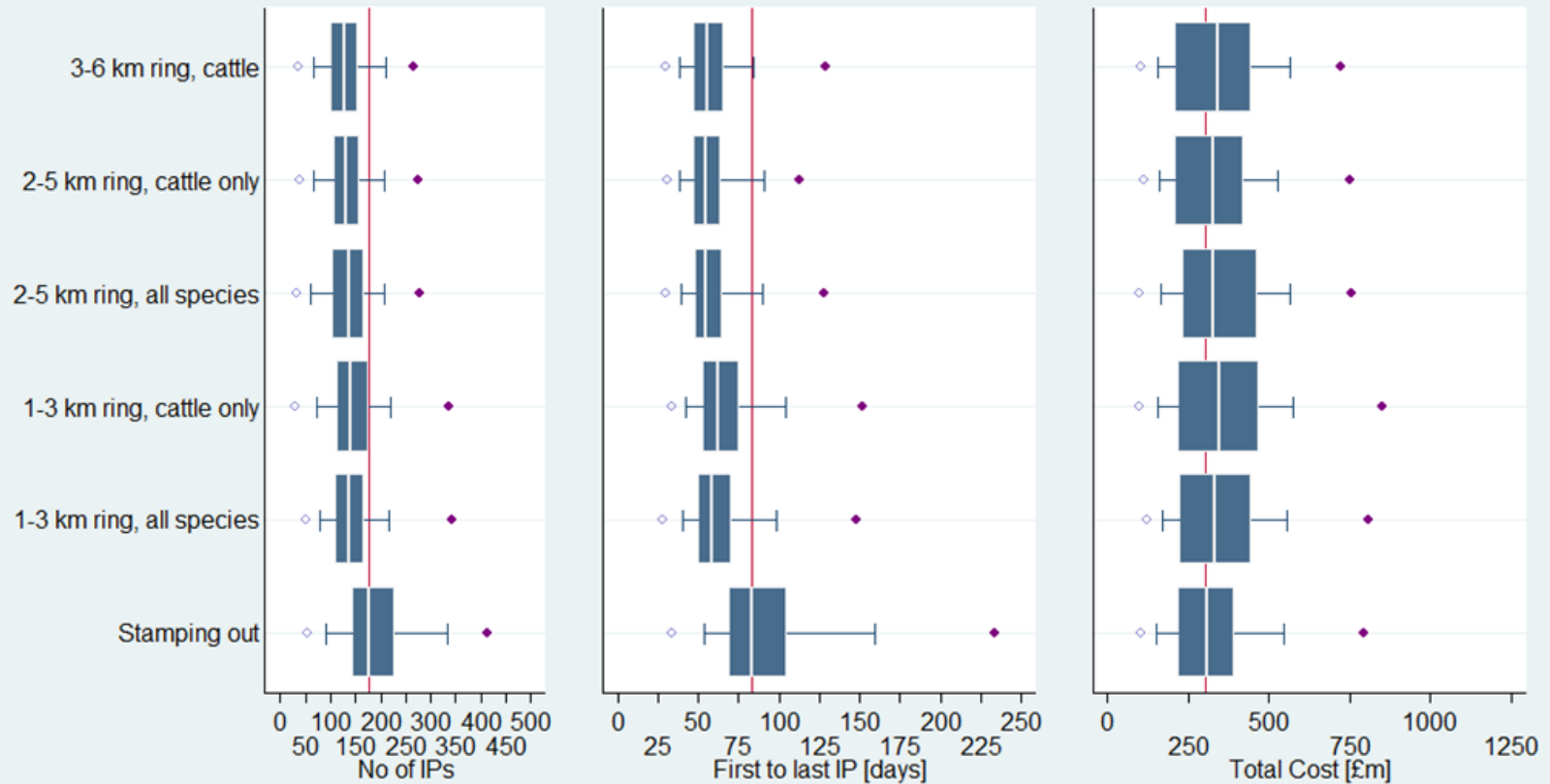
FMD modelling in 2016

2016: Lessons learnt from 2001

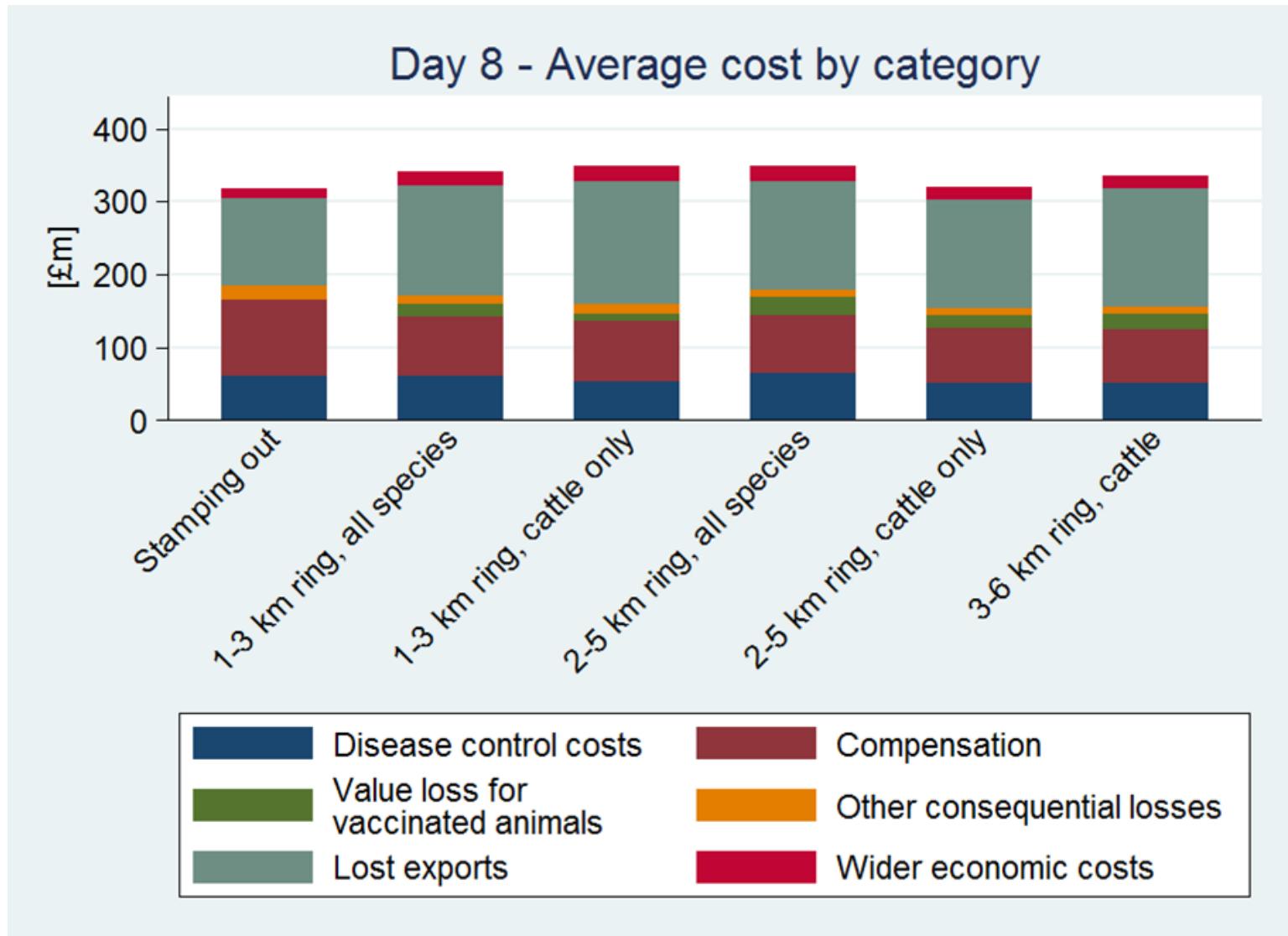
- **Capability** – in-house epi & economic models; QM standing capacity framework; meteorological model (NAME)
- **Engagement** – annual modelling symposium; QUADS studies
- **Data** – access to demographic data and outbreak reporting systems
- **Costs** – integrated approach to epi and economic modelling
- **Commissioning and Challenge** – ICF group, SAC-ED
- **QA** – government guidelines for producing quality analysis for government

2016: Integrated epi & economic outputs

Day 8 - Vaccination starts on day 14



2016: Economic breakdown





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Modelling for decision-makers

Modelling for decision-makers

Value

- **Peacetime** – developing strategies in preparation for an outbreak.
- **Outbreaks** – predicting and evaluating the effectiveness of control policies during an outbreak.
- **Integrated modelling** – Epidemiology, Economics, Resource.
- **Communicating impact** – visual communication of an outbreak and the impact of control measures.

Modelling for decision-makers

Limitations

- **Early in an outbreak** – high uncertainty, expert judgement may be more appropriate.
- **Not reality** – they are an approximation of possible outcomes.
- **Limited certainty** – communication of limitations.
- **Interpretation of outputs** – beware the central estimate being received and then presented as fact, without caveat.
- **One part of the decision-making process** – many other considerations for policy...



Modelling for decision-makers

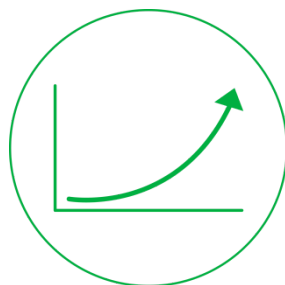
Challenges

- **Communicating uncertainty** – especially important in the early stages of an outbreak.
- **Data** – access to real outbreak data.
- **Engagement with policy** – trust in validity of models.
- **Engagement with external modellers** – maintaining ongoing communication and collaboration.
- **Conflicting advice/outcomes from models** – what is right? consensus may not be the correct approach.



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Applying new approaches to knowledge transfer



Overview

- EuFMD online training platform
- APHA training initiatives
- National and regional disease exercises
- Forward Look

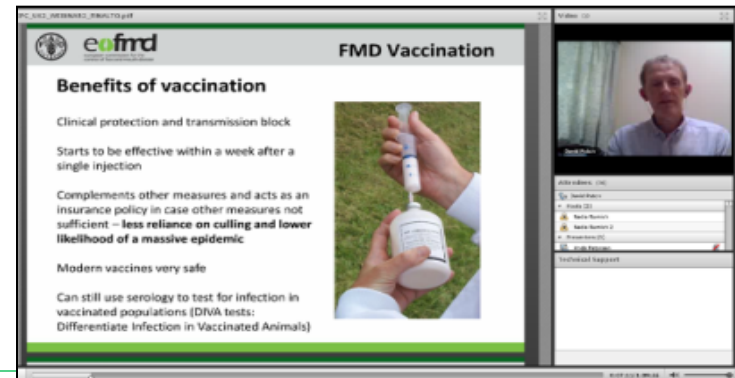


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EuFMD online training platform

FMD Emergency Preparation Course (FEPC)

- Flexible online interactive training delivery
- Course runs over four weeks (approx. 12 hrs study in total)
- Participants undertake training at their own speed and around business as usual work
- Experienced course tutors drawn from EuFMD, The Pirbright Institute and APHA
- Opening & closing webinars
- Pre-course quiz



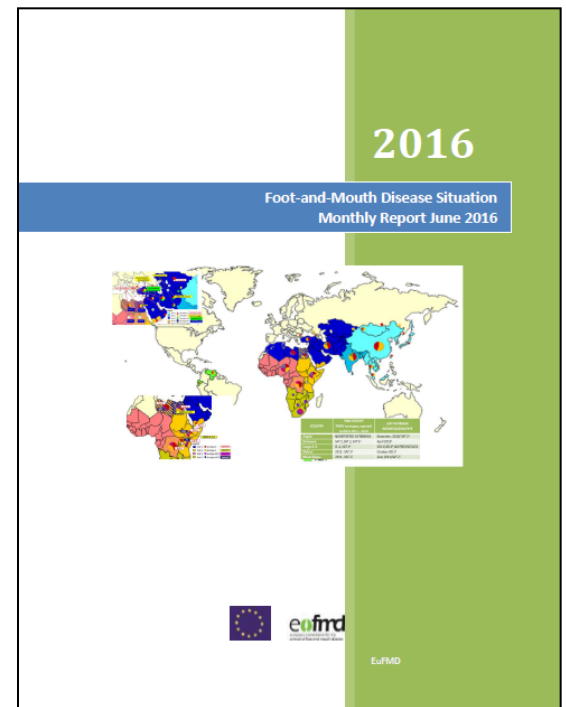
FEPC: content

- Aetiology & Pathogenesis of FMD
- Clinical & Laboratory Diagnosis
- Epidemiological Investigation
- Biosecurity
- Scenario exercise
- Interactive discussion forum for each module for tutors to pose (e.g. differential diagnosis) and answer questions from participants
- End of course assessment
- CPD certificate (12 hours) awarded to participants who complete the course and pass the assessment



FEPC: post course

- Participants retain access to course content and a wide range of other EuFMD resources after the course closes
- Successful participants can also register to join EuFMD networks on:
 - FMD Modelling
 - FMD Contingency Planning
 - FMD Vaccination
- Participation in other EuFMD webinars
- Access to EuFMD monthly Global Reports



FEPC: Feedback

- 100% of participants would recommend the course to other UK veterinary colleagues
- Feedback at conclusion of both courses run so far demonstrated an increase in confidence to be able to:
 - Recognise clinical FMD in pigs and ruminants
 - Collect the correct diagnostic samples
 - Undertake a detailed veterinary inquiry and collect essential epidemiological information



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National and regional disease exercises

Disease Exercises

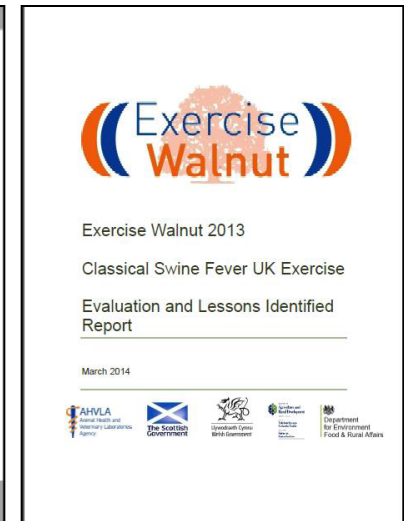
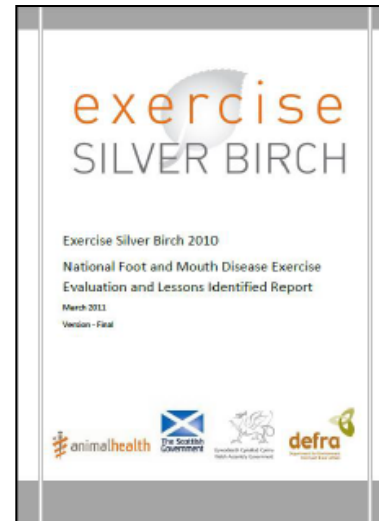
- **National Exercises:**

- FMD (2010)

- CSF (2013)

- FMD desktop (2015) to explore issues around decision to vaccinate

- FMD desktop (2016) to explore resourcing for a large scale FMD outbreak



Regular programme of **regional exercises** e.g. AI, Rabies, AHS

Forward Look

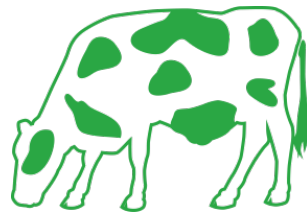
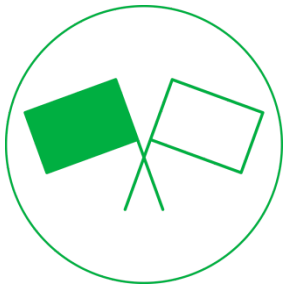


- APHA Operations Manual currently available to all staff on-line and can be downloaded onto laptops for out of hours access
- Work in progress to develop a format compatible with waterproof, disinfectable devices (e.g. tablets) for bio-secure use on farm
- Access to operational instructions and ability to stream images and commentary from suspect premises in 'real time'
- Facilitation of electronic capture and transmission of essential epi information
- Potential to develop training modules similar to EuFMD FEPC for other major exotic notifiable diseases e.g. avian, swine fevers



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Maintaining and making best use of global funding in support of research and innovation.



The Plowright high containment building at Pirbright: Opened 2015



Photo courtesy of HDR Architecture, Inc.; © 2014 James Brittain

Current Challenges

- Continued economic uncertainty since 2008
 - Contraction of public sector activities
 - Increasing difficulties in securing research funding for animal health
- Geopolitical instability
 - Impacting on veterinary services
 - Displacement of people and their animals
- Increasing disease challenges

We can't all do everything



STAR-IDAZ Global Network for Animal Disease Research



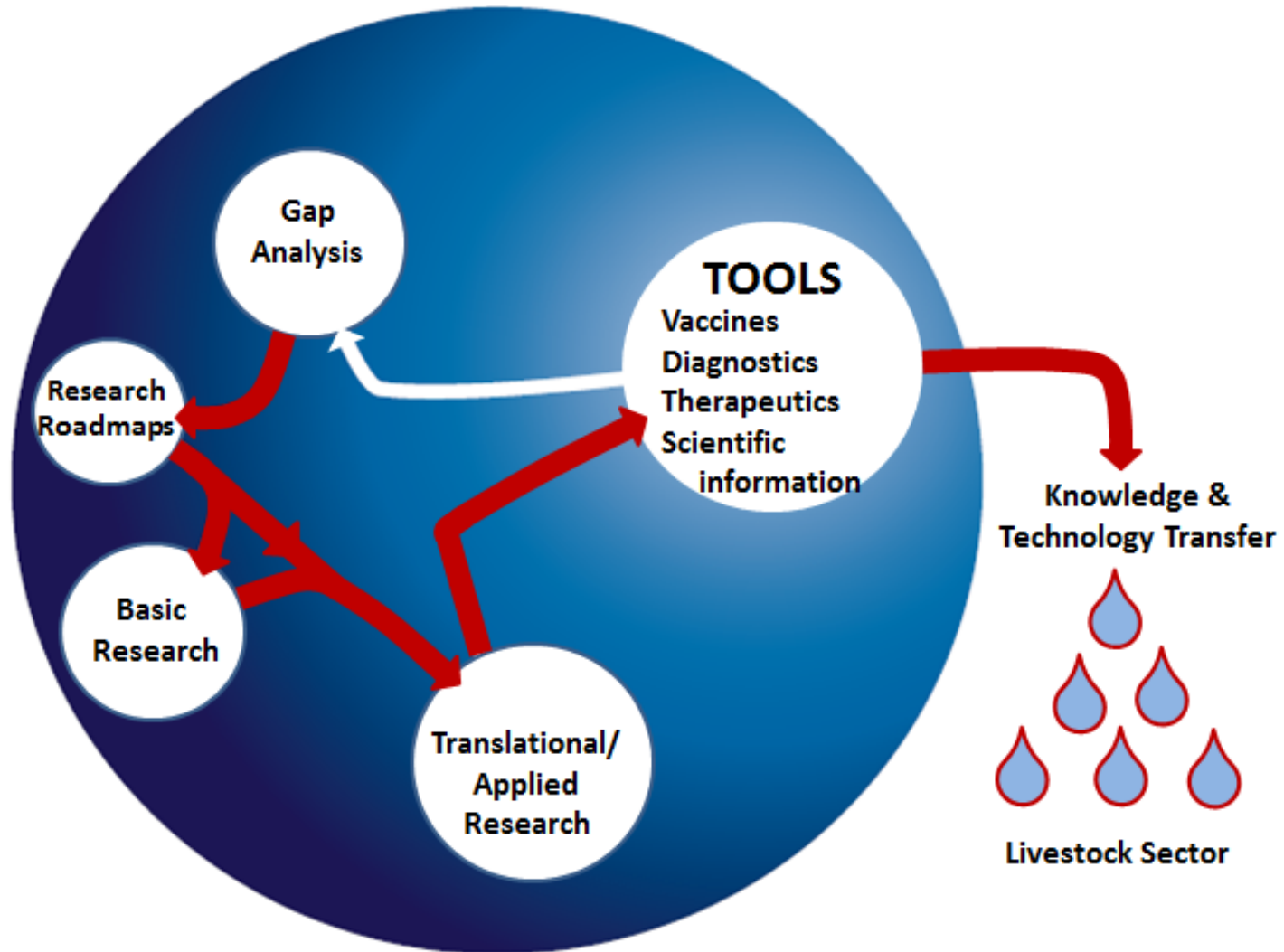
“Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses”

A global initiative to address the coordination of research programmes at international level in the area of animal health and in particular infectious animal diseases including zoonoses.

Issues identified by the STAR-IDAZ foresight activities needed to protect against future challenges

- Research pipeline – investment in basic research
- Sound public policies relating to science and technology
- Maintenance of capacity
- Partnerships/collaborations are needed
- Knowledge management system
- Knowledge/technology transfer

The Research Pipeline



International Research Consortium on Animal Health (IRC)

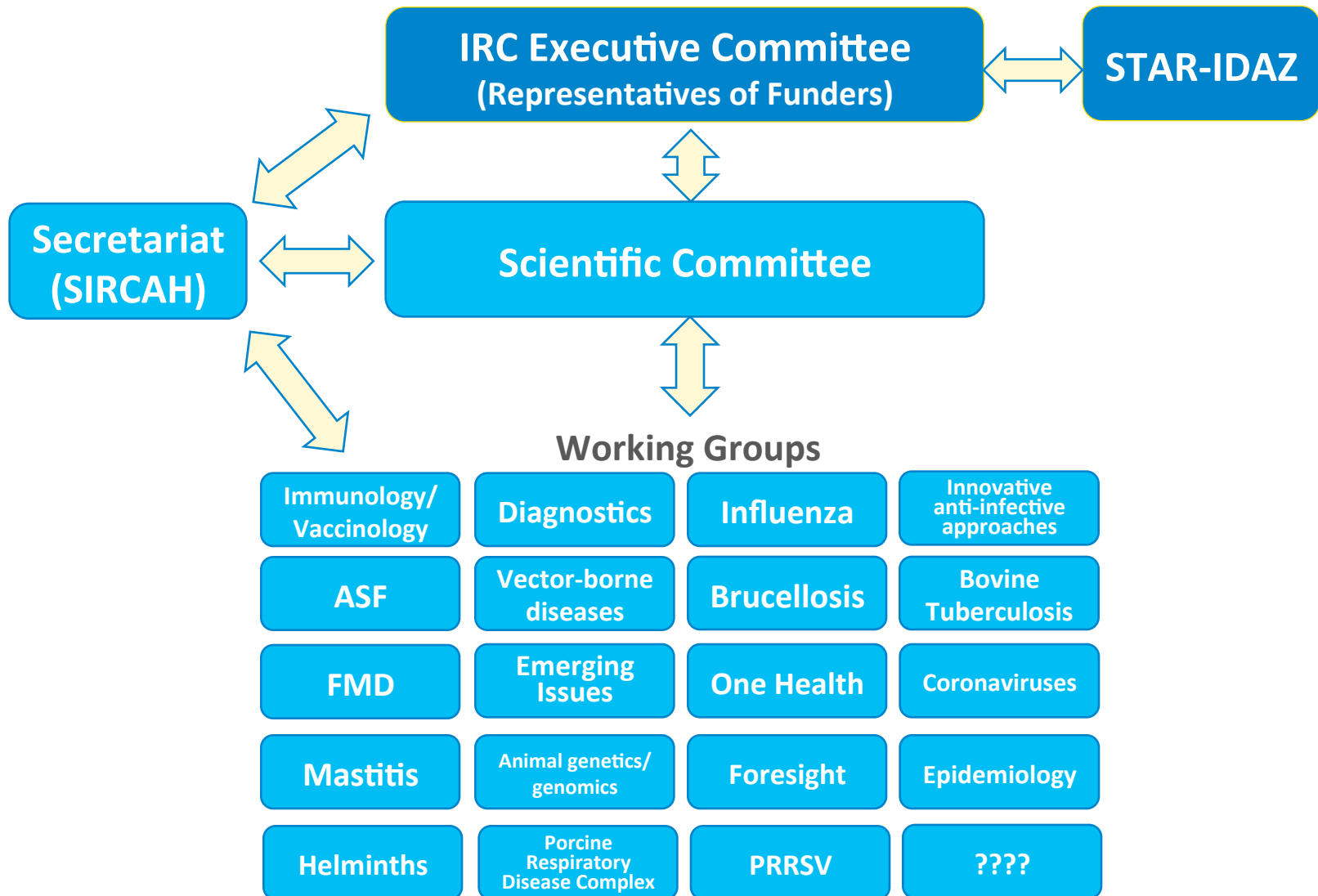
Initiative to coordinate research at the international level to contribute to new and improved animal health strategies for at least 30 priority diseases/infections/issues.

The deliverables include:

- Candidate vaccines
- Diagnostics
- Therapeutics
- Other animal health products and procedures
- Key scientific information/tools to support risk analysis and disease control

- **16 partners from 13 countries plus one international organisation and three from industry with the EC planning to join**
- **Total combined research budget of \$US 2.5+ billion**
- **IRC Secretariat supported by €3 million EU H2020 grant**

IRC Governance Structure




IRC Launch




IRC Partners (to date)

- National funding bodies/Programme Owners
- Research Institutes which function as Programme Owners
- Pharmaceutical Industry
- Representatives of the Diagnostic Industry

Global FMD Research Alliance



**Global Foot-and-Mouth Disease (FMD)
Research Alliance**



- Home
- General Information
 - Annual Reports
- FMD News (RSS Feed)
- Meetings & Events
- Membership
 - Members
 - Associates
 - Collaborators
 - Membership Options
- Research Projects
- Publications
- GFRA Presentations
- FMD Resources
- Disease BioPortal
- Contact

VISION OF GFRA
A coordinated global alliance of scientists producing evidence and innovation that enables the progressive control and eradication of FMD.


MISSION OF GFRA
To establish and sustain global research partnerships to generate scientific knowledge and discover the tools to successfully prevent, control and eradicate FMD.

PROGRAMS OF GFRA
GFRA aims to expand FMD research collaborations worldwide and maximize the use of resources and expertise to achieve its five strategic goals (see below).

Several research programs are currently active in Europe, North America, South America and South-East Asia. GFRA programs will continue to expand the alliance in these areas and will actively reach out to new areas of the world that have a stake in the progressive control and eradication of FMD.

STRATEGIC GOALS OF GFRA

- Goal 1.** Facilitate research collaborations and serve as a communication gateway for the global FMD research community



**Global Foot-and-Mouth Disease
Research Alliance**

Further information on the STAR-IDAZ International Research Consortium on Animal Health (IRC)

www.star-idaz.net

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Summary

1. UK experience of modelling in support of FMD control
2. Applying new approaches to knowledge transfer
3. Maintaining and making best use of global funding in support of research and innovation

