VirtualVet:
a global animal disease tracking capability

Toby Mottram

An integration of internet tools to build maps of farm animal disease

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Prof. Toby Mottram FREng

- Inventor of robotic milking
- Emeritus Professor of Agritechnology, Royal Agricultural University
- Founder of engineering companies
  - Manufactures rumen pH telemetry bolus
  - Automated inline milk sensing

Animal Health Data

- Why do we want it ?
- Our vision for the future
- How we are building farm level data sets
- Roadblocks that prevent progress
- A call for project partners

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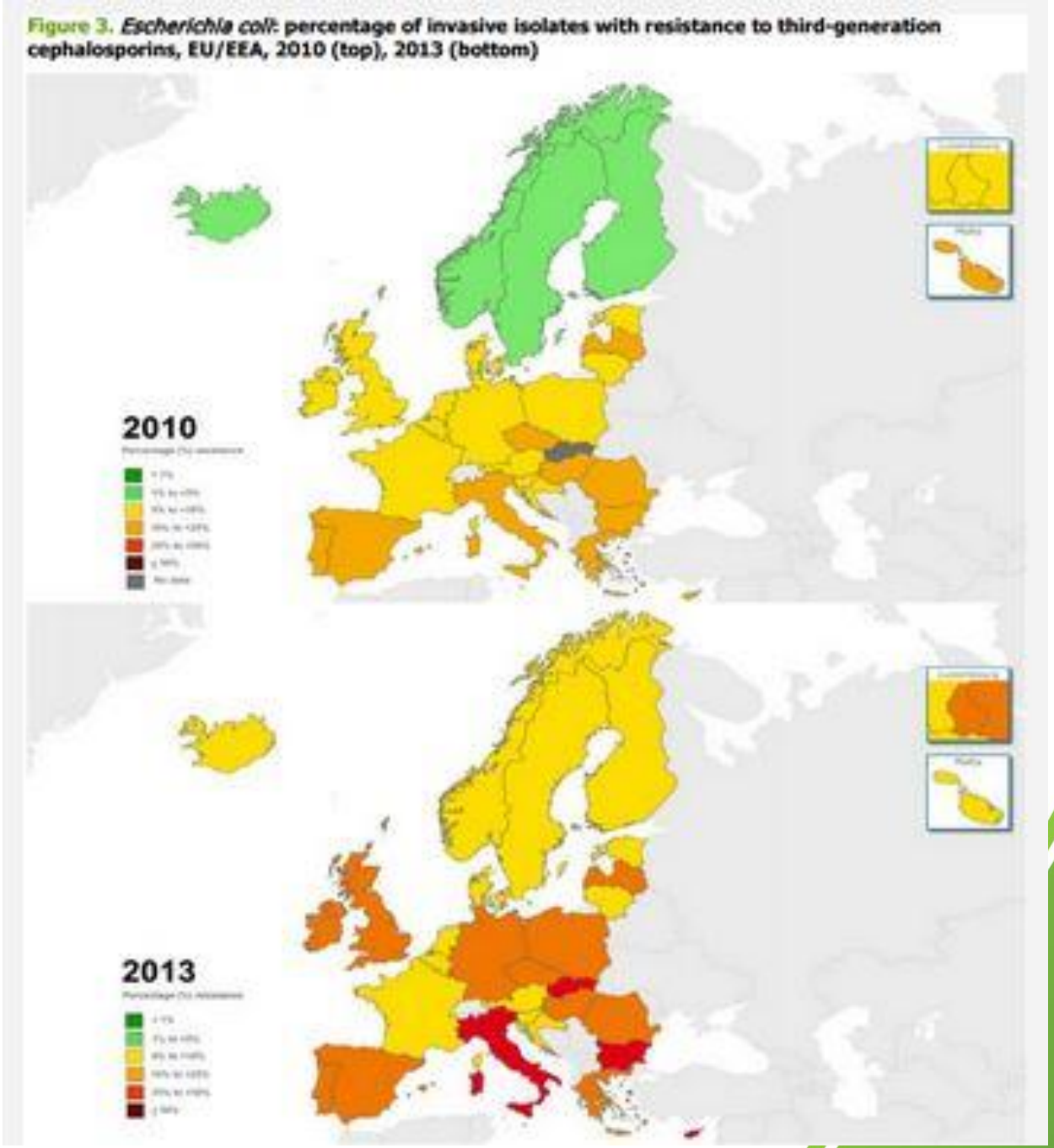
The Problem Zone



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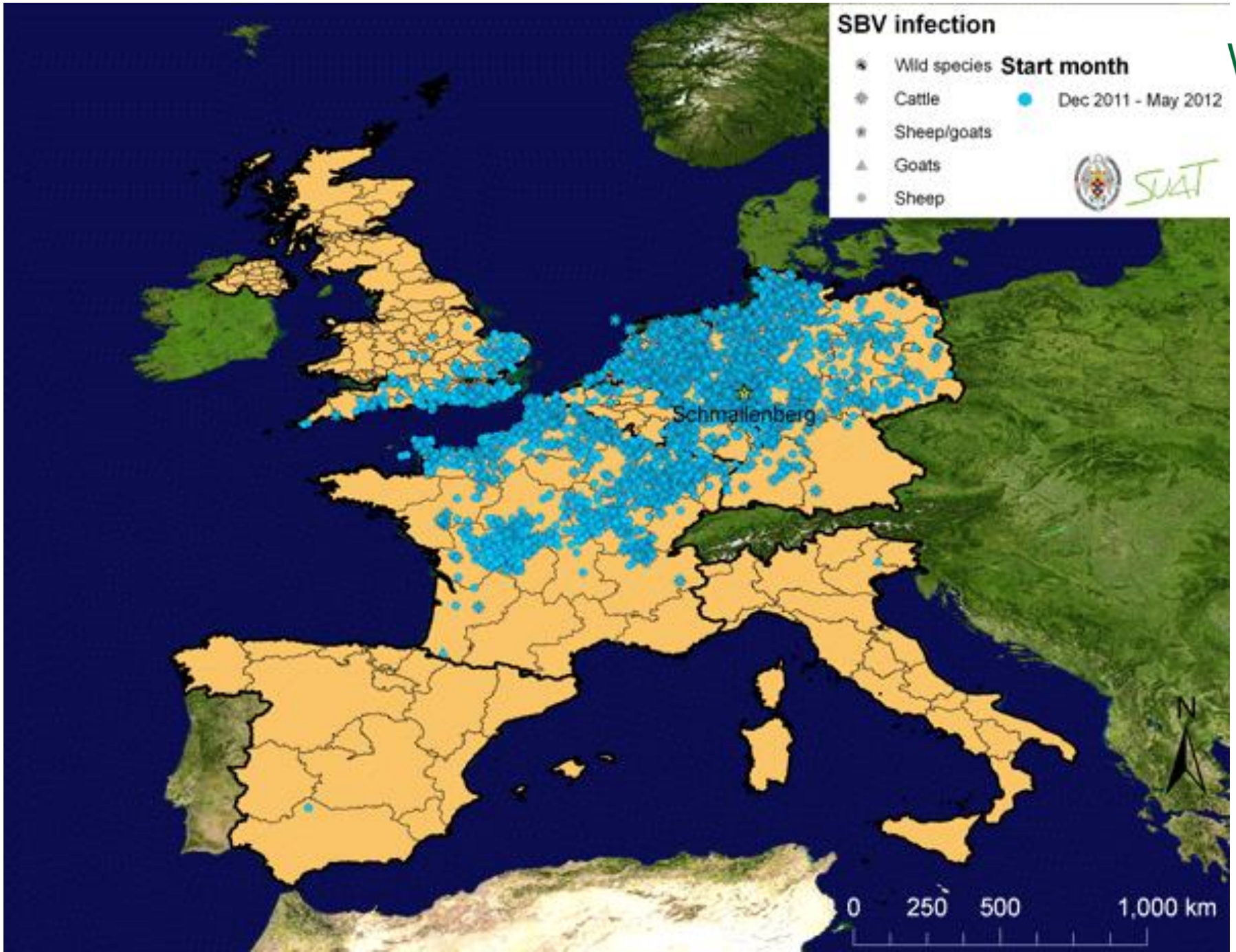
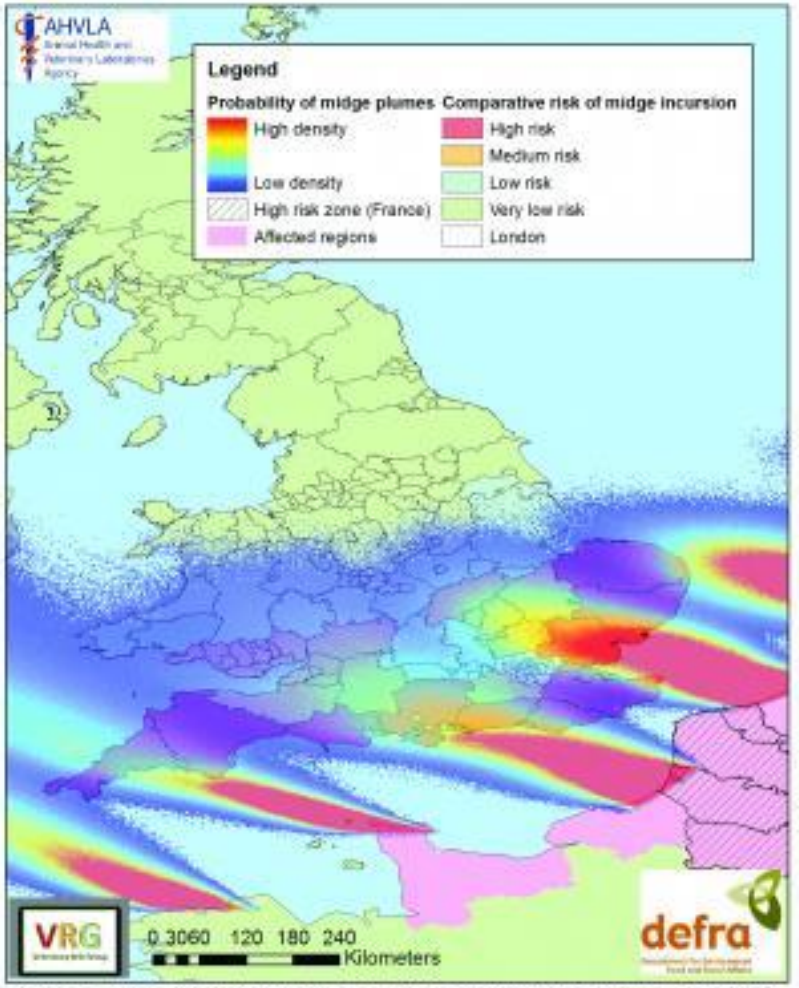
New diseases: Schmallenberg

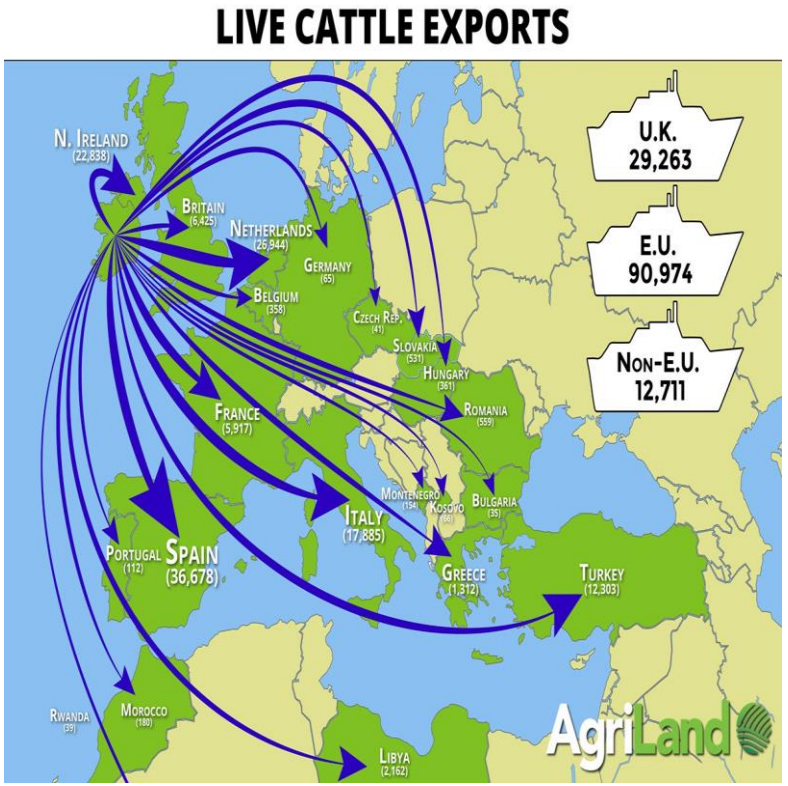


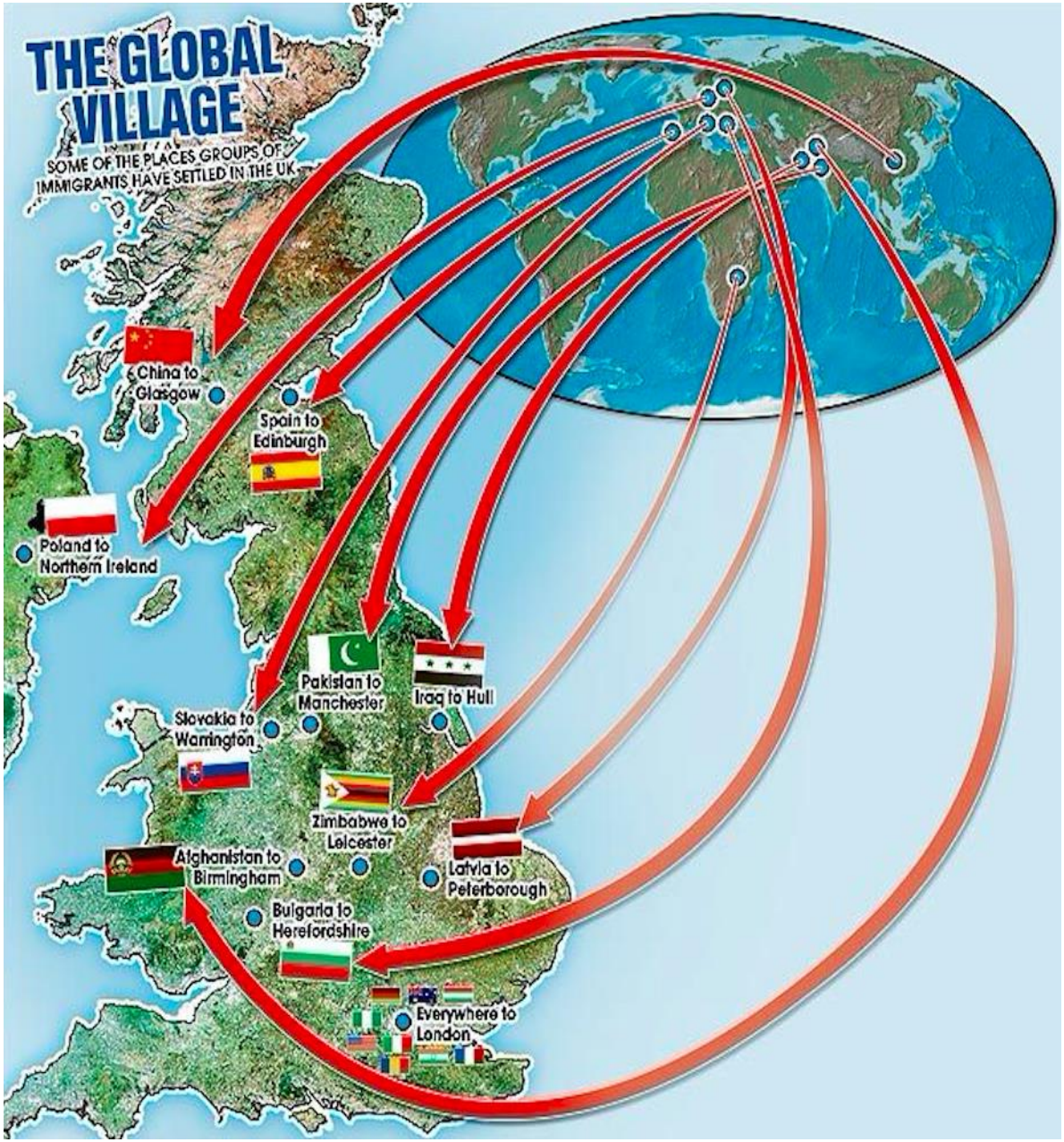
Modelling exists retrospectively



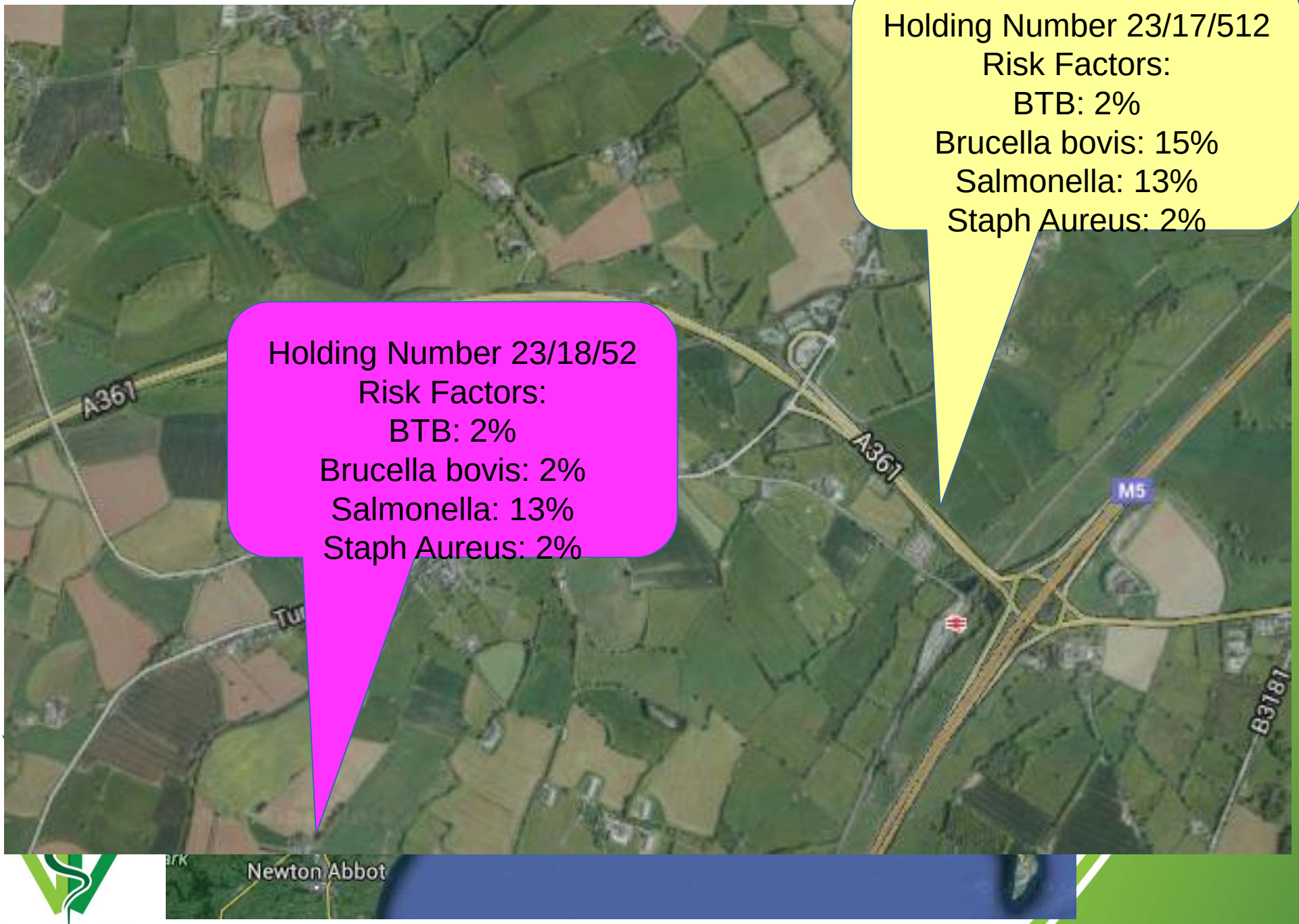
Comparative risk of vector incursion between July and November 2011 with plume for 13/11/2011.
(Note: plumes suitable for vector incursion occurred on less than 20% of days during this period)

Disease vectors are not just weather based





- Track movement of livestock
- Against:
  - Human movement
    - Weather Patterns
      - Bird Migrations
- To predict the dynamics


Holding Number 23/17/512
Risk Factors:
BTB: 2%
Brucella bovis: 15%
Salmonella: 13%
Staph Aureus: 2%
Holding Number 23/18/52
Risk Factors:
BTB: 2%
Brucella bovis: 2%
Salmonella: 13%
Staph Aureus: 2%
A361
A361
M5
B3181
Newton Abbot

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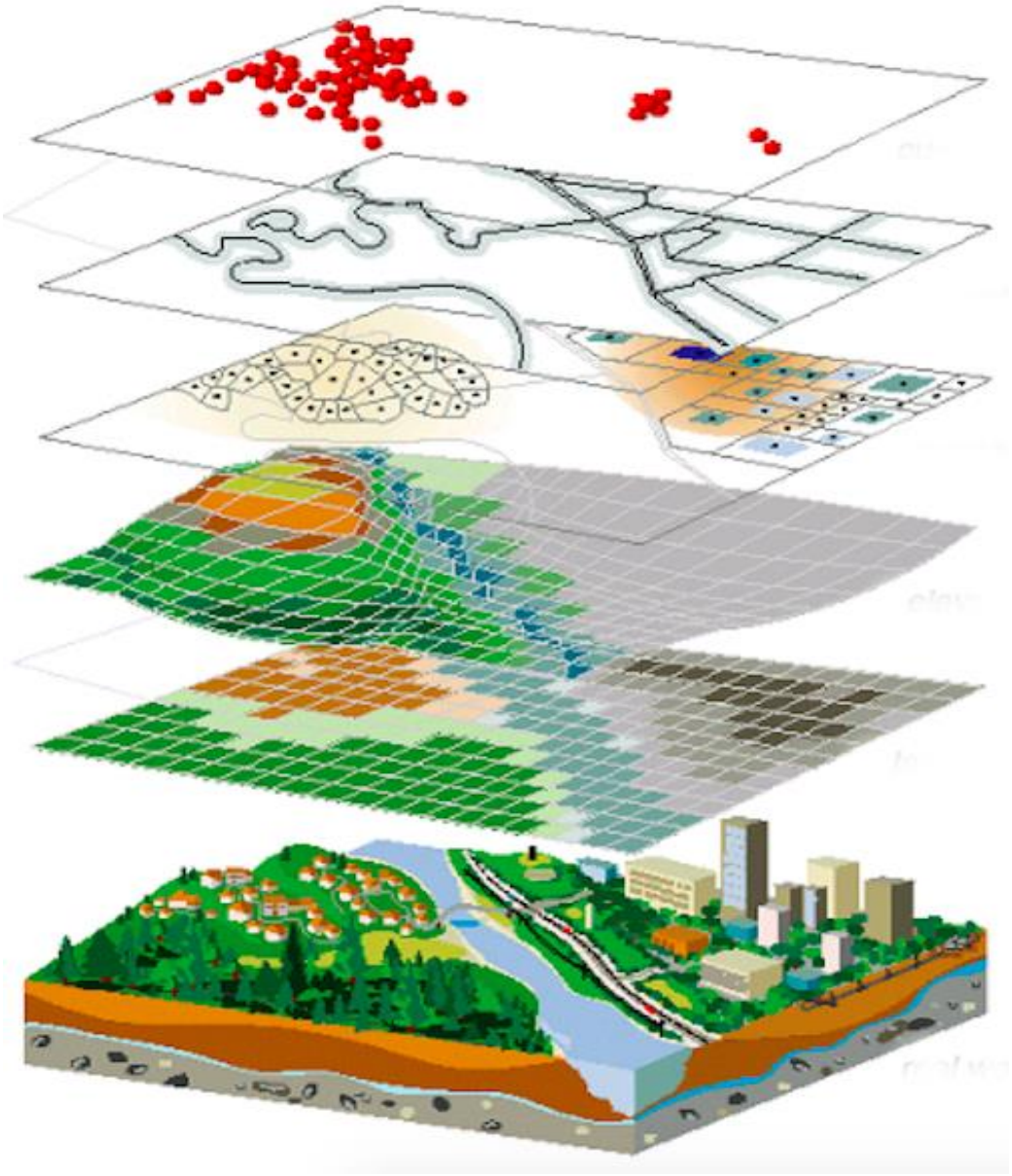
VirtualVet Data Layers

Layered Representation



- Disease pattern
- Ship/Trade Routes/Road maps for the Cattle Movement
- People/Bird Migration
- Prevailing winds/Weather Patterns
- Longitudinal animation
- Geographical Layer

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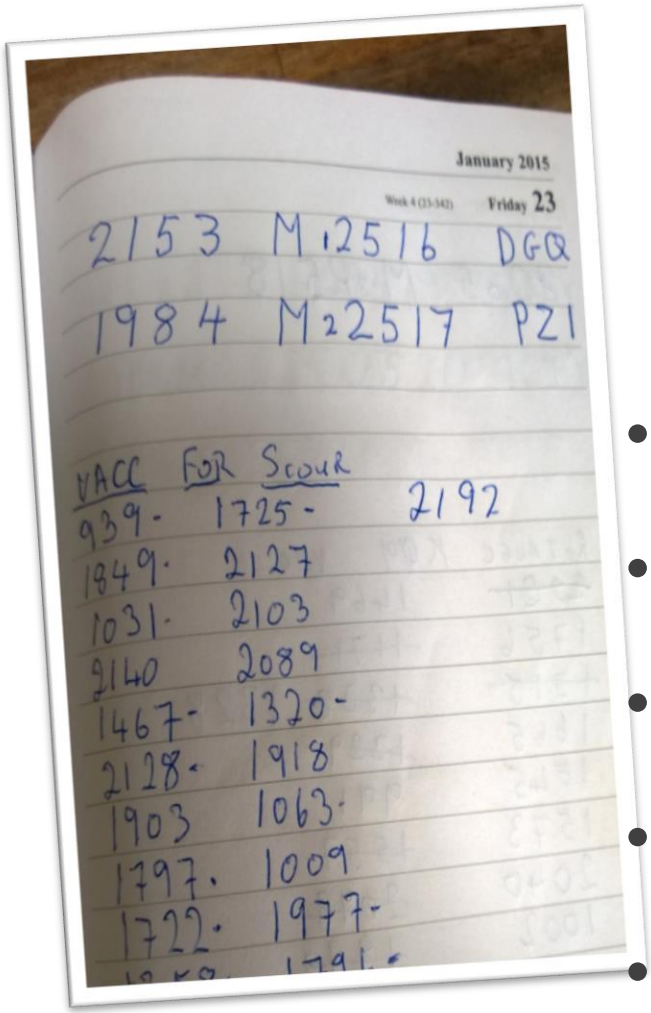
PC: Dirk Pfeiffer, Epidemiological Spatial Analysis of Animal Health Problems, Royal Veterinary College University of London



Current Systems

- Proforma books
- Farm diary
- Vet invoices
- Mandatory for single farm payments
- Required by supply chain managers

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Regulatory Framework

- Some diseases must be notified
- Veterinary treatments are regulated
- Regulated system is paper based
  - Does not aggregate data
  - Is widely ignored
  - Out of date
- EU new regulatory framework proposal
- EU directive to be IT based (we hope)

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Our First Concept

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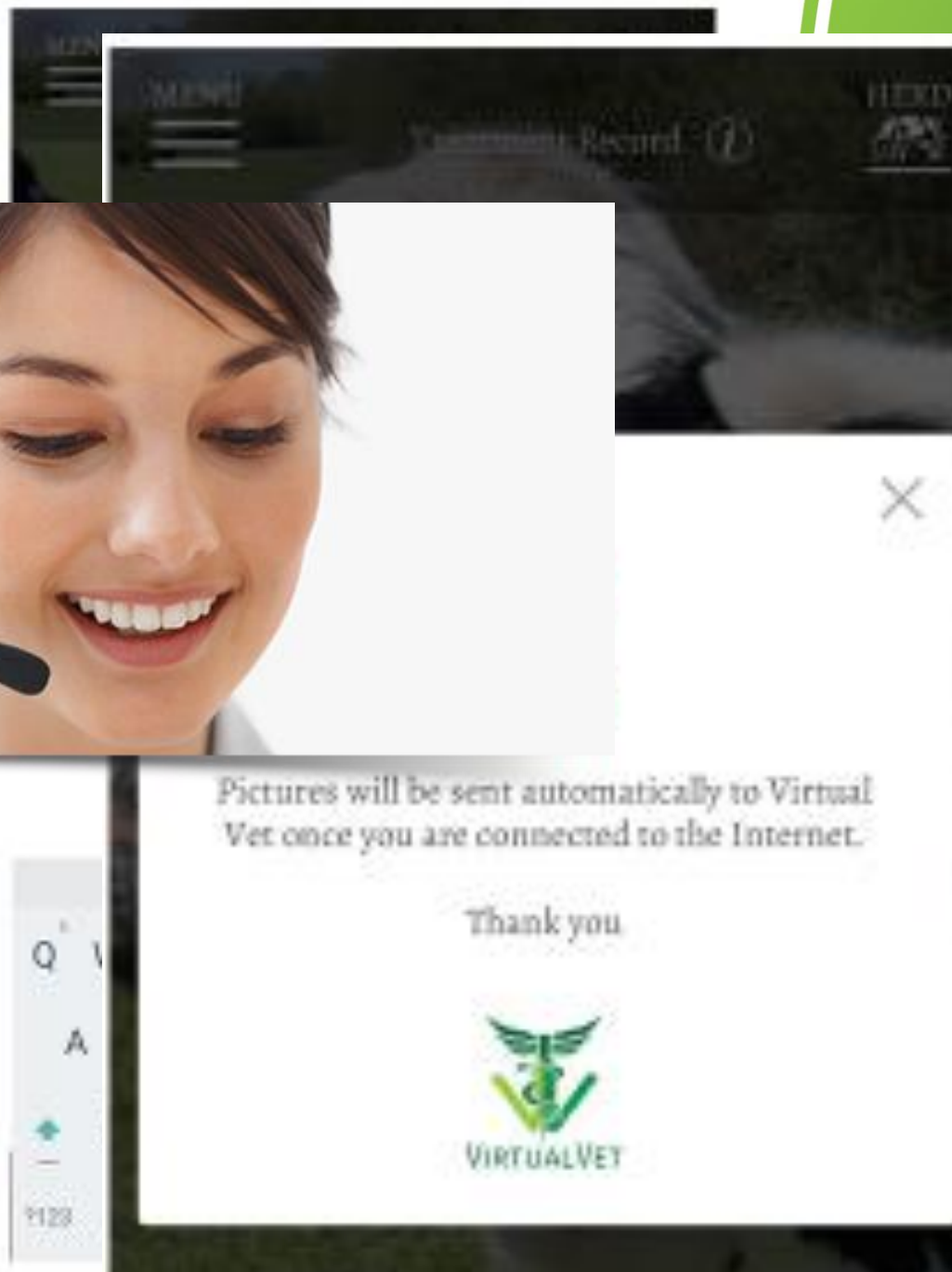
VirtualVet System is multi channel proac

- Take a snap and send c

  - Backfill any missing data
etc)
  - What happened to the a



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Farmers like to talk

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So lets talk to them !

Testing this summer: Reactions so far

- “Thank you” most common response.
- In 3 months, we are in 6 counties, with 50 farmers.
- 6000 animals
- A mix of dairy, beef, sheep and goats.
- About to sign a farm-fork poultry producer.
- Three farm audits approved by Bordbia

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Benefits of this methodology

- Quick and easy on farm
- Entry to data base is automatic
- Follow up is proactive
- Consistent data entry
- Outcome of treatment data
- Automated Drug Book for audit

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Farm Animal Health Data Sources

Source	Quantity	Quality /Granularity	Availability	Comment
Government Monitoring	Low	Farm level Annual	Yes	Hard to access
Pathology reports	Low	Highly detailed	On request	
Automated Husbandry systems	Huge	Poor	Farm level	No outcomes data for disease
Vet Practice	Low	High	Practice and farm level	Few outcomes
Animal Movements	Huge	Births,deaths , locations	National	Some outcomes
Pharma sales	Medium	Who bought what	Commercial	No outcomes no location

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So farm level data is building

- Now what ?
  - Build the integration layers

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Roadblocks - Cultural

Farmers are frustrated with ticking boxes for everyone else:-

- Vested interests
- Software companies

- In-depth conversations with farmers reveals no concern at data **exchange –** but a value has to be given to these data.

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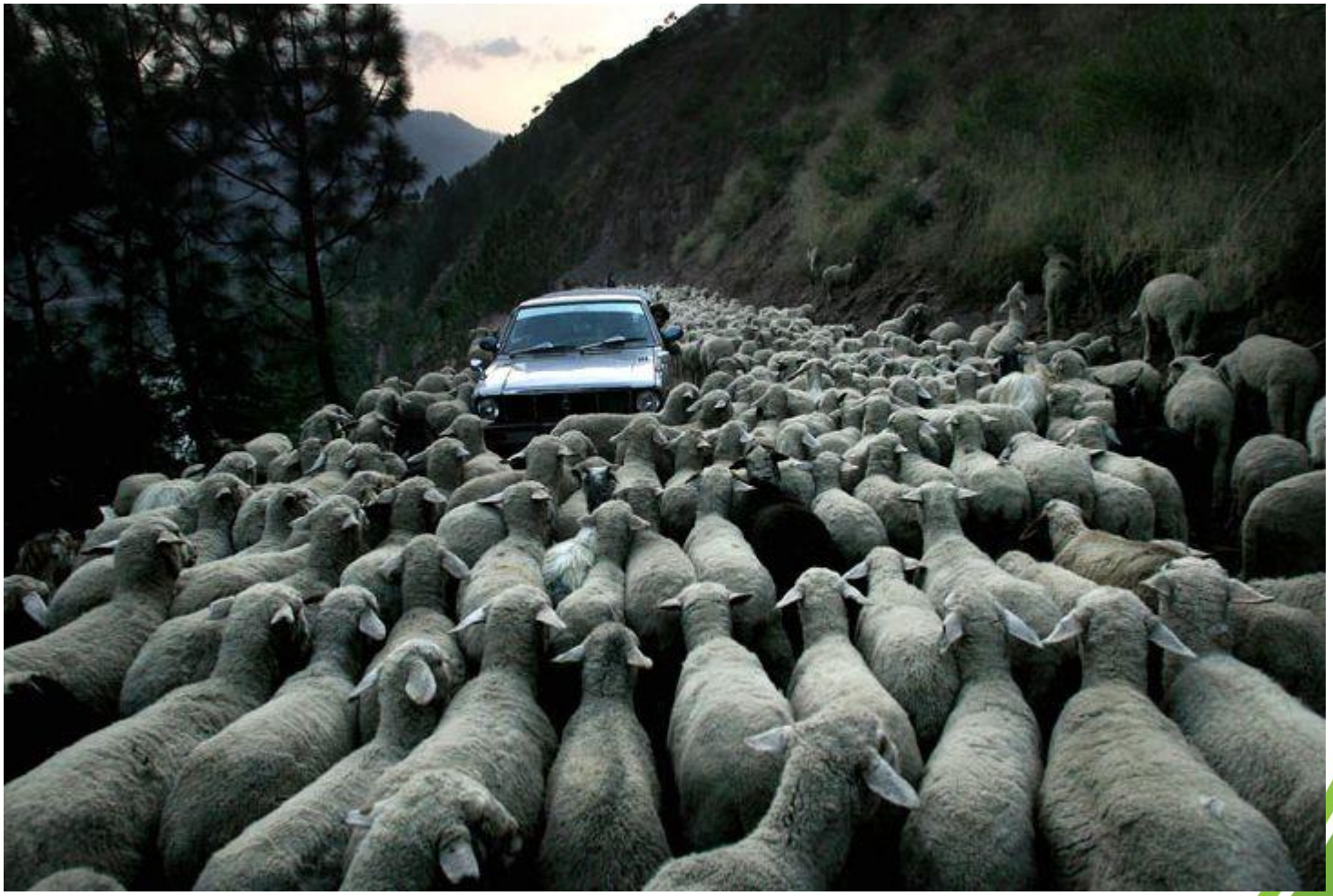
Roadblocks



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Roadblocks - Technical

- Where’s the data ?
- The curse of .pdf and annual aggregation
- Can anyone find national datasets with ease ?

- GDPR is a possible fix
  - – using .csv & Excel

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Roadblocks - corporate

- Ignorance of animal health issues at senior level
- Senior managers hide behind “technical issues”
- IP used as an excuse
- Ownership of data

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Roadblocks – legal & business

- Who owns/can sell data ?
  - Farmer who bought the product ?
  - Supplier of machine that recorded it ?
  - The owner of the server on which it is stored
  - The aggregator who adds value
  - The government who created the infrastructure ?
  - The programmer that built the links and algorithm
  - The graphic artist that created the

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Copyright law (under WTO rules) makes it

Who wants the data ?

- Farmers – annual audit
- Vets – outcome & billing check
- Food buyers – provenance check
- Governments – antimicrobial use monitoring
- Pharma – do their drugs work ?

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Positive EU progress

- GDPR – greater awareness of data controller/data processer and the concept of data protection
- Data driven economy – welcome encouragement of data as a resource and asset for trade to contribute to meeting societal challenges.
- CAP Reform – remote inspections, collaborative approach to resource monitoring and usage, encouraging use of ICT.

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Summary

- Animal health data is vital for food security
- VirtualVet has a method of data collection
  - App collection
  - Telephone follow up
- VirtualVet seeks project partners

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What do we want ?

- EU Open Animal Health Data Service
- Documented links to open data sources
- Fair copyright framework
- Open access data sets
- Project Partners

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Www.virtualvet.eu