Detection of (re)emerging vector-borne diseases in the Dutch surveillance system

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Aim

- Describe surveillance components for detection of (re-)emerging vector-borne diseases
- Illustrate with the Dutch surveillance system
Fundamental tools for surveillance

1. Passive reporting system
2. Use of existing data sources
3. Simple representative survey
4. Simple risk-based survey
Surveillance in the Netherlands

- Since 2002, national surveillance for 4 species
- Carried out by the Animal Health Service (GD)
- Financed 50/50 livestock industry and Ministry
Surveillance objectives

1. Early detection exotic diseases
2. Early detection new disorders
3. Trends of diseases & relevant parameters
Passive reporting component: GD-Veekijker

- Consultancy for practitioners and farmers
- Five veterinary cattle health specialists
- ~4000 calls/year
- Calls are rewarding for both sides
  - Free diagnostic farm advise
  - Early detection
- Good coverage across veterinary practices in the Netherlands

Tel. 0900-7100 000
Pathology & vet. laboratory

- Veterinary laboratory ~4 million tests/yr.
- Accessible post mortem investigation
  • Carcasses are collected on-farm
  • Partly subsidized rates
  • ~3000 cattle submissions/year
  • 7 specialised pathologists
- Submissions are rewarding for both sides
  • Farm diagnosis
  • Early detection
Surveys

- Testing samples with the aim to detect a specific (notifiable) disease
- Continuously throughout the year/ at specific times
- In vectors is usually less efficient
- Expensive
- Risk-based (e.g. through risk analysis)
Syndromic surveillance

- Existing data
- Focus on elevations of (non-specific) disease indicators
- Real-time
- Logistic and computational constraints
- In NL: Support for passive surveillance
  - E.g. # of submissions for necropsy
  - Etc.
Cattle Health Surveillance GD

Objectives
- Trends
- Outbreaks
- New phenomena

Aggregation and interpretation

Instruments
- Data-analysis
- Surveys
- "GD-Veekijker" = passive reporting
- Pathology & Laboratory

Source
- Farmers and practitioners

Pilots

data-suppliers
Vector-borne cattle diseases in NL

Exotic
- Bluetongue (2006)
- Parafilaria bovicola (2008)
- Schmallenbergvirus (2011)

Endemic
- Anaplasma phagocytophilum
- Babesiosis (B.divergens)
Bluetongue notification

2006

- August 14th contact with GD-VeeKijker
- BTV suspected based on symptoms and (no) results of therapy, farm visit with authorities
- August 15th positive tests at CVI

2007

- Sentinel study in 275 herds, ~4400 seronegative cattle, monthly testing (early July)
- Notification of clinical signs (end of July)
Detection of the Schmallenbergvirus outbreak

• Last week of August 2011:
  - 5-fold increase in phone calls about diarrhoea and milk production drop, fever, recovery in 3-5 days

• September 1\textsuperscript{st}:
  - Pilot investigation in affected herds (farm visits)
  - Diagnostics (including microarray screening methods)

• November/December:
  - FLI reports the discovery of SBV
  - Malformed lambs and calves at necropsy
  - Acute cases test PCR-positive
Discussion

• **Context**
  - Infrastructure (e.g. access to vets/diagnostics, phone, internet)
  - Existence of data sources (e.g. I&R)
  - Epidemiological and analytical skills

• **Policy**

• **Multiple surveillance components**
  - Sensitivity and specificity
  - Costs and benefits
Conclusions

• Current passive surveillance components were timely in detecting emerging vector-borne diseases
• Survey can be efficient when infection is expected
• Syndromic surveillance supports passive surveillance rather than replacing it (see Madouasse, Fourichon and Brouwer)
Questions?