Enhancing passive surveillance in the UK

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Overview

Background
- Past surveillance system
- Drivers for change

New surveillance model
- Progress
- Challenges

Future developments
Surveillance in the UK

Mandatory reporting
E.g. Notifiable diseases
Zoonoses Order

Voluntary reporting
E.g. GB wildlife disease surveillance partnership

Early warning (scanning) surveillance – to detect new, unexpected or changed patterns of disease
Involves international disease monitoring, horizon scanning, veterinary investigation of disease outbreaks

Risk based
E.g. Post import checks, AI Centre entry checks, Wild bird mortalities

Targeted surveillance - structured approach to answer a specific question
E.g. Annual survey for Brucella melitensis in sheep and goats
Scanning Surveillance – the pyramid of surveillance

- All Animals
  - Those that have disease
    - Those detected by farmer
      - Examined by Veterinary Surgeon
        - Sampled
          - Samples sent to AHVLA/SRUC
            - Diagnosis made
              - Diagnosis recorded
                - Data only captured at this level at present

- Clinical syndrome or proxy measure recorded
- Clinical syndrome recorded

Use of laboratory data to reduce the time taken to detect new diseases: vida to LamFile

Gibbens, S. Robertson, J. Willmington, et al.  
Veterinary Record 2008 162: 771-776  
10.1136/vr.162.24.771
Opportunities to improve scanning surveillance

Identified through a number of reports

• To improve coverage and representativeness of the surveillance system
• To widen the surveillance network to include private practitioners and other PME providers
• To increase intelligence exchange between Government, vets and the livestock industry, with surveillance being seen as a shared responsibility.
• To enable the development and maintenance of expertise of all those working within the surveillance system.
Key elements of new model

• Network of AHVLA PME facilities (reduced in number)
• Carcase transport system introduced for 3 years from some areas
• Inclusion of other expert PME providers in the system
• Training and supporting private vets and fallen stock industry to carry out more diagnostic PMEs
• Surveillance Intelligence Unit

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Previous network of AHVLA PME facilities

New network of AHVLA PME facilities
Communication & engagement

• Development of PVS / OV / Surveillance web gateway
• Looking at options to improve two-way communication flow inc. online forums, use of social media
• Development of PVS user group for process & system changes
• Similar activities to engage with farmers and industry groups
• Improve pathology training for private vets to enable more first opinion PMEs at fallen stock centres or elsewhere, speeding up the diagnosis of more common issues as well as providing surveillance data
Surveillance Intelligence Unit

- Epidemiology and data analysis skills
- Species expert groups
- Engage with alternate data sources to improve coverage
  - Collate and analyse epidemiological, pathological and diagnostic testing results (from AHVLA and partner providers) & combine with knowledge of the livestock population and industry practices.
  - Explore other/new sources of data and intelligence to add value to the analyses to provide horizon scanning and reassurance of early warning of new and emerging threats.
  - Produce and publish reports that can be used to support evidence based decision making at all levels from farmers to Government

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Applied epidemiology - weak spots in surveillance?

- Using laboratory submissions as a measure of veterinary engagement and a proxy for surveillance activity
Syndromic surveillance - exploiting unused data

North West

South East

South West

Aug 2011

Jan 2012

Veterinary Laboratories Agency
Surveillance Gap analysis

- 29 gaps; cattle (10), sheep (12), pigs (11) and poultry (11)
- Most gaps around ‘engagement’ and ‘risky behaviour’
  - Disengaged farmers
  - Early adopters of unproven husbandry methods
  - Geographical areas
    - Non-TB areas with fewer vet visits
    - Distant from post mortem sites
### Gap analysis

- **29 data sources**
- **Limited evaluation**

#### 1. Quick look up table of surveillance data sources

<table>
<thead>
<tr>
<th>Type of data source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vet data</strong></td>
<td></td>
</tr>
<tr>
<td>1. Active collection direct from private vets (formal sentinel data collection)</td>
<td>Formal collection of electronic data about farm visits, likely to include clinical data, gross path and provisional diagnostic outcome (sentinel system)</td>
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<tr>
<td>2. Active collection direct from private vets (informal data collection from key informants)</td>
<td>Regular collection of information about animal health and unusual events from key informants</td>
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<tr>
<td>3. OVS visits for inspection or testing</td>
<td>For example, Defra animal health and welfare visits, cross compliance visits on behalf of rural payments agency, TB testing. These visits currently collect specific information depending on the purpose of visit but may offer an opportunity to collect animal health data</td>
</tr>
<tr>
<td>4. Notifiable disease reports</td>
<td>Collection of information from statutory reports of suspect notifiable disease including information about investigatory visits, will include clinical information</td>
</tr>
<tr>
<td>5. OVS visits to investigate disease occurrence</td>
<td>For example anthrax investigations. Information not currently recorded about clinical signs or likely cause of death but could provide an opportunity to do so</td>
</tr>
<tr>
<td>6. Pharmaceutical sales information</td>
<td>Could be used as a health indicator</td>
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<tr>
<td><strong>Production data</strong></td>
<td></td>
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<tr>
<td>7. Endemic disease recording</td>
<td>Information recorded by industry in health schemes, disease control initiatives or quality assurance schemes e.g. mastitis data and BPEX endemic disease records – outcomes may be based on clinical, laboratory or abattoir inspections</td>
</tr>
<tr>
<td>8. Performance / production indicators</td>
<td>Information collected by industry support bodies about production / performance of individual animal or farms e.g. dairyco performance index</td>
</tr>
<tr>
<td>9. Active collection directly from farms</td>
<td>Sentinel farms could provide information about clinical disease and production</td>
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<tr>
<td><strong>Healthy cattle to market or abattoir</strong></td>
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<tr>
<td>10. Ante-mortem abattoir data</td>
<td>Includes clinical information from ante-mortem inspections</td>
</tr>
<tr>
<td>11. Post-mortem abattoir data</td>
<td>Includes gross pathology from post-mortem examinations, FSA data available via RAPID system</td>
</tr>
<tr>
<td>12. Market inspections</td>
<td>Could provide an opportunity to record clinical disease occurrence</td>
</tr>
<tr>
<td><strong>Pre-diagnostic and diagnostic laboratory data</strong></td>
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<tr>
<td>13. AHVLA (SAC) laboratory network of sample submission data from private</td>
<td>Collection of data about samples or carcasses voluntarily submitted by private vets including demographic, clinical, gross pathology, laboratory results including antimicrobial resistance, diagnostic outcome or non-diagnostic outcome</td>
</tr>
<tr>
<td>14. AHVLA (SAC) laboratory network of carcass submission data from private vets</td>
<td>Collection of data about carcasses voluntarily submitted by private vets including demographic, clinical, gross pathology, laboratory results, diagnostic outcome or non-diagnostic outcome</td>
</tr>
<tr>
<td>15. AHVLA (SAC) surveillance intelligence network of other data from private vets</td>
<td>Collection of data about clinical cases identified by private vets in telephone calls and web-based which includes demographic and clinical information</td>
</tr>
<tr>
<td>16. Private veterinary laboratories</td>
<td>Collection of data with samples submitted to private laboratories, may include some clinical information, will include laboratory diagnostic outcome</td>
</tr>
<tr>
<td><strong>Fallen stock data</strong></td>
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<tr>
<td>17. Mortality data (fallen stock)</td>
<td>Collected for TSE investigations in ruminants including cause of death in cattle, mortality data also available from cattle passport returns</td>
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<tr>
<td>18. Animal movement data</td>
<td>For example CTS, AMLS. Also provides mortality information but without cause of death</td>
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<tr>
<td><strong>Other surveillance networks</strong></td>
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<tr>
<td>19. University surveillance networks</td>
<td>Could include both information collected at university visits to farms and data collected from local PVS, likely to include clinical, gross pathology, provisional diagnostic outcome and possibly diagnostic test laboratory test information</td>
</tr>
<tr>
<td>20. Media based</td>
<td>Event-based systems collect data from various electronic sources of media information to provide evidence about the occurrence of health events</td>
</tr>
<tr>
<td>21. Livestock populations outside the population of interest</td>
<td>Horizon scanning information to identify threats to the population of interest e.g. information from surveillance networks in other countries or information about disease occurrence in other farmed species</td>
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<tr>
<td><strong>Surveys</strong></td>
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<tr>
<td>22. Repeated active surveys</td>
<td>Designed to collect data about the occurrence of specific diseases</td>
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<tr>
<td>23. Vector surveillance</td>
<td>Designed to collect data about the distribution and density of insect vectors</td>
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<tr>
<td><strong>Supporting data sources</strong></td>
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<tr>
<td>24. Public health data</td>
<td>For zoonotic disease. Could be used to indicate the occurrence of disease in animal populations</td>
</tr>
<tr>
<td>25. Wildlife population data</td>
<td>Could be used as an indicator of animal health issues</td>
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<tr>
<td>26. Demographic data</td>
<td>For example census data which may provide information about changes in the population that may threaten health</td>
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<tr>
<td>27. Economic indicators</td>
<td>For example changes in price structures which may impact on animal health</td>
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<tr>
<td>28. General public</td>
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<tr>
<td>29. Supporting data</td>
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Components 1-27 identified from previous work in ED1039
Components 28-29 identified from Surveillance 2014 consultation
Horizon scanning

• News, media and internet items

• Collaborative work with the **Defence Science and Technology Laboratory (Dstl)**
  – ensures that innovative science and technology contribute to the defence and security of the UK
  – “speech tagging”
  – “sentence graph”
  – “information fusing”…
Big data pilot

“VIDA Lite” from practitioners – practice level surveillance

Pre-diagnostic data from laboratory submissions

3rd party PME providers

Vet med sales

Cattle abortion notification data

All cause mortality data

Free text in laboratory reports

Horizon scanning – news media

VIO-PVS conversations data

Veterinary forums

Farmer social media

3rd party PME providers

Free text in laboratory reports

Veterinary forums
New reporting

Across the range of scanning surveillance activities

Multiple sources

Multiple contributors
Responding to the novel

Reporting
- No barriers - trust and transparency
- Open communication – Government, European partners, livestock industry and other stakeholders
- Establish common evidence base and understanding of risk
- Work to develop generic contingency plan for new disease threats

Investigation and research
- Expertise to interpret alerts – investigate, monitor, negate?
- Collaboration – efficient, share skills & expertise
- Expertise – pathology, test development, new methods
- Capability across full range of threats – known and unknown
- Drawing on knowledge and resources of everyone that has an interest
Key messages

– Maintain capability to detect and respond
– Look to improve by using new methodologies and developing a more risk based approach
– Need agreement and understanding of roles and responsibilities, and build on partnership working
– Breadth of capability and deep expertise with networks in UK and internationally to deal with new threats
• Thank you for your attention