FADs in Cattle, Swine, Sheep, Goats and Poultry in Sweden, How were they Detected?

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Abstract

An evaluation of the different surveillance systems in real life situation in Sweden, expressed as the number of detected FADs for each type of surveillance was performed. The results support the opinion that the clinical surveillance is a critical element of the early recognition of FADs. It is also suggested that these data can be used if results of modelling the combined effect of several surveillance systems are to be compared with historical data.

Introduction

Much effort is laid down on surveillance aiming at detecting new or re-emerging foreign animal diseases (FADs) or to document freedom from diseases (Doherr and Audige, 2001). When disease prevalence becomes very low, the cost for surveillance, based on structured sample surveys, increases. It is therefore a need to estimate the efficiency of all different parts of the whole surveillance system. Recently methods for estimation of the combined effect of several surveillance systems, both structured sample surveys as well as non-random data sources such as clinical surveillance has been described, as well as methods that takes account of historical data (Cameron. A. et al.,Schlosser and Ebel, 2001). However, the efficiency of different surveillance systems, especially the passive clinical surveillance, where owners or veterinarians identifies clinical suspicious cases and initiates further investigations for diagnosis, may be difficult to estimate. It is quite obvious that the efficiency of clinical surveillance differs between diseases but it can also be expected that a difference may occur between countries as well as over time.

In the present paper different surveillance systems' ability in detecting FADs in a real life situation was investigated. The results can be used to highlight the efficieny of different systems and also to compare modelling results of disease surveillance with historical data.

Objective

The aim was to evaluate the efficiency of different surveillance systems in real life situation in Sweden, expressed as the number of detected FADs for each type of surveillance.

Methods

Information on selected new or re-emerging notifiable diseases in cattle, swine, sheep and goats and in poultry detected during the last 30 to 40 years, were collected from records from the Board of Agriculture and the National Veterinary Institute, from veterinarians involved in the investigations and also from the literature. Only outbreaks where information about the year of detection was available and where it was possible to judge how the first suspicion of disease arose were included.

Results

Sufficient information was available from 19 notified cases in cattle, swine, sheep or goats. Eight (42 %) were detected by the clinical surveillance, 4 (21 %) by meat inspection, 3 (16 %) by surveillance, 2 (11 %) by surveys and 1 by pre-export testing, and trace back investigation respectively (Table 1). In poultry, sufficient information was available in 13 notified cases. Eleven cases (85 %) were detected by the traditional passive surveillance, 1 (8 %) by meat inspection, 1 (8 %) by surveillance.

Table 1. New or re-emerging notifiable diseases/infectious agents (*n*=19) detected in cattle, pigs, sheep, goats and farmed deer during the last 30 to 40 years

Detected by / Disease/Infectious agent	Species
Clinical surveillance	
Johnes´disease	Cattle
Salmonella Typhimurium DT104	Cattle
Scrapie	Sheep
Caprine arthritis-encephalitis	Goat
Mycoplasma mycoides subsp. *mycoides*, LC type	Goat
Aujeszky´s disease	Pig
Post weaning mulitisystemic wasting syndrome (PMWS)	Pig
Mycobacterium bovis	Farmed deer
Meat inspection	
Mycobacterium bovis	Cattle
Parafilaria bovicola	Cattle
Antrax	Cattle
Maedi	Sheep
Surveillance at semen stations	
Infectious bovine rhinotracheitis	Cattle
Surveillance of fallen stock and at slaughter	
BSE	Cattle
Atypical scrapie, NOR-98	Sheep
Serological surveys	
Leptospira Bratislava	Pig
Q fever	Sheep
Trace back investigation from human disease	
E coli O157, VTEC	Cattle
Pre-export testing	
Infectious bovine rhinotracheitis	Cattle

Table 2. New or re-emerging notifiable diseases/infectious agents (*n*=13) detected in poultry during the last 30 to 40 years

Detected by / Disease/Infectious agent	Category of poultry
Clinical surveillance	

Infectious bronchitis (IB)	Laying hens
Egg drop syndrome (EDS 76)	Broiler parents
Goose parvovirus infection (Derzy's disease)	Geese
Chlamydophila spp.	Game birds
Newcastle disease (PMV-1)	Broiler breeders
Salmonella Pullorum	Backyard chickens
Botulism (*Clostridium botulinum*)	Laying hens
Avian pneumovirus infection (APV)	Broiler breeders
Infectious laryngotracheitis (ILT)	Backyard chickens
Fowl cholera (*Pasteurella multocida*)	Backyard chickens
Very virulent infectious bursal disease (vvIBD)	Broilers
Meat inspection	
Ornithobacterium rhinotracheale (ORT)	Turkeys
Surveillance	
Highly pathogenic avian influenza (HPAI H5N1)	Game birds

Discussion

These findings show that the traditional passive clinical surveillance has been the most important surveillance method to detect FADs in Sweden during the last 30 to 40 years. Thus, it supports the opinion that the clinical surveillance is a critical element of the early recognition of FADs.

It was not possible to estimate the relative cost effectiveness of the different surveillance systems as the costs for each surveillance system was not available. It can however be concluded that the costs for surveillance of FADs by clinical surveillance, meat inspection and trace-back investigations probably has been the most cost efficient methods in the past 30-40 years as they detected 13 of the 19 (ruminants and pigs) and 12 of 13 (poultry) of the notified diseases and were not associated with any extra costs for surveillance.

Although clinical surveillance is generally considered valuable, a drawback of this methods is the difficulty to quantify it's effect for documenting disease freedom. However with recently developed methodology such surveillance methods could in the future be included in quantitative documentation for disease freedom (Cameron. A. et al., Doherr and Audige, 2001).

It is however important that the efficiency of clinical surveillance is further evaluated as it can be expected to vary depending on a range of factors. For example, factors relating to the particular disease or the affected population, as well as availability of qualified veterinarians and costs for consulting them, or costs for sending animals to autopsy, will be of importance. Last but not least, the availability of fundings for re-imbursement for actions taken by authorities when eliminating FADs will most surely affect the willingness of owners to report suspected FADs.

References

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