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Animal Disease Surveillance in South Africa

Submitted by South Africa

Introduction

1. Animal disease surveillance depends on the availability of efficient and adequately funded Veterinary Services, with expertise in the epidemiology of the various animal diseases, access to a properly equipped laboratory capable of carrying out the required diagnostic procedures and co-operation with the community. Veterinarians (both state and private), as well as auxiliary animal health personnel, should be adequately trained in the clinical recognition of the diseases and in the procedures for the collection and dispatching of samples. Information dissemination to farmers and communities is also important for the recognition of clinical diseases and the early notification of disease outbreaks. Procedures should be in place for the rapid proper transport of samples to the laboratory and the onward dispatch of samples to national-, regional- or world reference laboratories.
2. Surveillance can be divided into active surveillance and passive surveillance.
 - a. Active surveillance is specific with respect to the confirmation of the suspect presence of a particular disease and the quantification of its prevalence or to demonstrate freedom from a specific disease or infection for a geographically defined area. This involves a system of reporting of any signs of disease activity that come to the notice of livestock owners and veterinarians, and an active programme of examination of statistically selected samples from within host populations in order to detect clinical signs or other indications of the occurrence of disease or the transmission of disease. In either case, any suspicion of disease activity should be followed up by quarantine, confirmatory diagnostic work and any required disease control measures.

- b. Passive surveillance involves monitoring in which data is gathered from the field in a similar manner, but no official action based on the findings is implied in the data-gathering activity (OIE Terrestrial Animal Health Code, Twelfth Edition 2003).
3. Various parties are involved in animal disease surveillance. These include the Government, private veterinarians, organized agriculture (farmers), the Onderstepoort Veterinary Institute (OVI), the Faculty of Veterinary Science of the University of Pretoria, local government, etc.

Active surveillance

4. Active surveillance in South Africa concentrates mainly on certain controlled animal diseases (in terms of the Animal Diseases Act (Act 35 of 1984). It is currently practiced on a routine basis in South Africa for Foot and mouth disease (FMD). It is also carried out occasionally for other diseases, for example African horse sickness (AHS). The same applies if active surveillance is required for export purposes. State Veterinarians (SVs) and Animal Health Technicians (AHTs) are involved in active surveys and samples are tested at officially recognized laboratories, for example the Exotic Diseases Division (EDD) of the Onderstepoort Veterinary Institute (OVI), where samples for Foot and Mouth Disease diagnosis are tested.
5. Examples of active surveillance that are being conducted on a regular basis in South Africa are:
- a. The FMD inspections that are performed in the FMD Control Area of South Africa: every 7 day inspections, every 14 day inspections and every 28 day inspections in the different parts of the FMD Control Area;
 - b. FMD sero-surveys are conducted on a routine basis in the FMD Control Area, as well as in other parts of South Africa as the need arises, for instance: to prove South Africa's freedom of FMD in its FMD Free Zone;
 - c. Regular surveys are being conducted in the Kruger National Park and other game reserves to determine the status of FMD in African buffalo and impala and bovine tuberculosis in wildlife;
 - d. AHS surveys are conducted on a regular basis countrywide in order to determine which virus serotypes are circulating in the equine environment and to adapt the AHS vaccine accordingly;
 - e. Surveys to determine the spread of the tsetse fly (*Ornithodoros moubata*) that plays an integral role in the transmission of African swine fever (ASF) to warthogs (*Phacochoerus aethiopicus*), bush pigs (*Potamochoerus* spp.) and domesticated pigs. The mortality rate of pigs suffering from ASF is very high, whereas warthogs and bush pigs develop a viraemia, but virtually no clinical signs;
 - f. In the poultry population surveys are being conducted when the need arises to determine the spread, if any, of Newcastle disease and avian influenza.

Passive surveillance

6. Passive surveillance is also carried out in terms of the Animal Diseases Act (Act 35 of 1984) and involves the controlled animal diseases, as well as any disease that does not occur in the country. It also includes samples tested for diseases that do occur in the country, as part of health monitoring programmes to evaluate the efficacy of vaccination programmes. The cost of these tests is carried by the commercial farmers themselves.

7. Residue monitoring to determine the presence of antibiotic and other residues in products from food-producing animals is also carried out on a routine basis in the country.

Controlled animal disease

8. According to the Animal Diseases Act (Act 35 of 1984), a controlled animal disease is an animal disease in respect of which any general or particular control measure has been described, and any animal disease, which is not indigenous or native to the Republic. The Act stipulates that any outbreak or suspicion of an outbreak, has to be reported to the nearest state veterinarian or animal health official. The state veterinarian will then see to it that control measures are instituted. Failure to do this may lead to a fine or even a prison sentence.

Controlled animal diseases for South Africa, as defined by the Animal Diseases Act (Act 35 of 1984), includes the following:

<u>Disease:</u>	<u>Species</u>
African horse sickness ¹	Equines and zebra
African swine fever ¹	Pigs, wild pigs, bush pigs, warthogs
Anthrax ¹	Cattle, equines, sheep, goats, pigs, ostriches, game
Aujesky's disease	Mainly pigs, also other animals
Bacterial kidney disease	Trout
Bovine contagious pleuropneumonia	Cattle
Bovine spongiform encephalopathy	Cattle
Bovine malignant catarrh	Cattle, blue or black wildebeest
Brucellosis ¹	Cattle, sheep, goats, pigs, dogs
Contagious equine metritis	Equines and zebra
Contagious haematopoietic necrosis	Trout
Contagious pancreatic necrosis	Trout
Corridor or buffalo disease	Cattle and African buffalo
Dourine	Equines and zebra
East Coast Fever	Cattle and African buffalo
Equine infectious anaemia	Equines and zebra
Equine viral arthritis	Horses
Equine influenza	Equines and zebra
European swine fever ¹	Pigs, wild pigs, warthogs, bush pigs
Foot and mouth disease ¹	All cloven hooved animals
Glanders ¹	Equines and zebra
Haemorrhagic septicaemia	Trout

¹ Causative micro-organism listed under the 'Non-Proliferation of Weapons of Mass Destruction Act (Act 87 of 1993)'

Johne's disease	Cattle, sheep
Nagana	Cattle, equines, game, dogs, pigs
Newcastle disease ¹	Poultry and birds
Psittacosis ¹	All birds, especially parrot family
Rabies	All mammals
Rinderpest ¹	All cloven hoofed animals, especially cattle
<i>Salmonella</i> Enteritidis	Poultry and birds
Scrapie	Sheep and goats
Sheep scab	Sheep and goats
Skin conditions of sheep	Sheep
Swine vesicular disease	Pigs
Tuberculosis	All animals, except fish, reptiles and amphibians

Notifiable Animal Disease

9. According to the Animal Diseases Act (Act 35 of 1984), a notifiable animal disease is an animal disease in respect of which any outbreak or suspicion of an outbreak, has to be reported to the nearest state veterinarian or animal health official. The state veterinarian will not necessarily institute control measures. Failure to do this may lead to a fine or even a prison sentence.

Notifiable Animal Diseases for South Africa, as defined by the Animal Diseases Act (Act 35 of 1984), includes the following:

Blue tongue¹
Lumpy skin disease;
Rift valley fever¹; and
Swine erysipelas.

Pathogens of animal origin that are listed in terms of 'Non-Proliferation of Weapons of Mass Destruction Act (Act 87 of 1993)'², that do occur in the Republic, but are not listed as 'controlled diseases':

Coxiella burnetti
Clostridium botulinum
Clostridium perfringens
Clostridium tetani
Enterohaemorrhagic *Escherichia coli*

10. Procedures that are followed in the control of animal diseases in South Africa are according to the guidelines that are determined by the OIE (World Organisation for Animal Health).

11. It should also be noted that, according to the Animal Diseases Act (Act 36 of 1984) (20): 'No person shall, except under a permit and in compliance with the conditions which are prescribed or, in any particular case, determined by the director –

² The complete list in terms of 'Non-Proliferation of Weapons of Mass Destruction Act (Act 87 of 1993)' is attached as an Appendix.

- a. conduct any investigation, experiment or research with any vaccine, serum, toxin, anti-toxin, antigen or other biological product which consist or originate wholly or partially of, or from, any micro-organism, or of, or from, the glands, organs, fluids or any other part, of an animal or parasite: Provided that the foregoing provisions of this paragraph shall not apply to any substance in so far as it is controlled under the Medicines and Related Substances Control Act (Act 101 of 1965);
- b. for the manufacture or evaluation of a product or remedy used for or intended to be used at or for the testing, diagnosis, prevention, treatment or cure of any animal disease or parasite, or for the maintenance or improvement of the health, growth, production or working capacity of an animal, use any vaccine, serum, toxin, anti-toxin, antigen or other biological product referred to in paragraph (a); or
- c. for the purpose of any investigation, experiment or research referred to in paragraph (a), or for the manufacture or evaluation of a product or remedy referred to in paragraph (b)-
 - i. infect or contaminate any animal or any other thing with any animal disease or parasite; or
 - ii. introduce into or collect in the Republic, or have in his possession, or remove or transport from the place where it is normally kept or found, any controlled animal or thing, or any protozoon, bacterium, virus, fungus, parasite, other organism or agent which is capable of spreading any animal disease or parasite.

12. Animal disease surveillance is thus facilitated by the various stipulations of the Animal Diseases Act (Act 35 of 1984).

13. It might also be worth pointing out that, with regard to most of the diseases that are listed in the 'Non-Proliferation of Weapons of Mass Destruction Act (Act 87 of 1993)', except for FMD, bovine tuberculosis, AHS, ASF, NCD and avian influenza, South Africa relies virtually exclusively on passive surveillance. This should serve to highlight the need to explore strategies aimed at improving the efficacy of passive surveillance by establishing and fostering a 'network' of possible informers, as well as a culture of active public participation in these passive surveillance efforts.

Annex I

ANIMAL PATHOGENS THAT ARE LISTED IN TERMS OF 'NON-PROLIFERATION OF
WEAPONS OF MASS DESTRUCTION ACT (ACT 87 OF 1993)

Viruses

Eastern equine encephalitis virus;
Western equine encephalitis virus;
Venezuelan equine encephalitis virus;
Rift Valley fever virus;
African swine fever virus;
African horse sickness virus;
Avian influenza virus;
Blue tongue virus;
Foot and mouth disease virus;
Goat pox virus;
Porcine herpes virus (Aujeszky's disease);
Swine fever virus (Hog cholera virus);
Lyssa viruses;
Newcastle disease virus;
Peste des petits ruminants virus;
Porcine enterovirus type 9 (swine vesicular disease virus);
Rinderpest virus;
Sheep pox virus;
Teschen disease virus;
Vesicular stomatitis virus;

Bacteria

Bacillus anthracis;
Brucella abortus;
Brucella melitensis;
Brucella suis;
Chlamydia psittaci;
Clostridium botulinum;
Clostridium perfringens;
Clostridium tetani;
Enterohaemorrhagic Escherichia coli, serotype 0157 and other verotoxin producing serotypes;
Francisella tularensis;
