Introduction

When an OIE listed disease or emerging disease occurs in a Member Country, Veterinary Services should implement a response control measures proportionate to the likely impact of the disease and as a result of a risk analysis, in order to minimise its spread and consequences and, if possible, eradicate it. These measures can vary from rapid response to a new hazard and management of outbreaks, to long-term control of an endemic infection or infestation.

The purpose of this chapter is to provide recommendations to prepare, develop and implement official control programmes in response to occurrence outbreaks of emerging or listed diseases, including zoonoses. It is not aimed at giving ready-made fit-for-all solutions, but rather at outlining principles to follow when combating animal diseases through organised control programmes.

The Veterinary Authority should determine which diseases to establish official control programmes against and at which regulatory level, according to an evaluation of the actual or likely impact of the disease. Disease control programmes should be prepared in advance by the Veterinary Authority and Veterinary Services in close collaboration with the relevant stakeholders and other authorities, as appropriate disposing of the necessary regulatory, technical and financial tools.

Control plans. They should be justified by rationales developed through risk analysis and considering taking into account animal health, public health, and socio-economic, animal welfare and environmental aspects. They should be supported by relevant cost-benefit analysis and include the necessary regulatory, technical and financial tools.

Official control programmes Control plans should be developed with the aim of achieving defined measurable objectives, in response to a situation in which purely private action alone is not sufficient. Depending on the prevailing epidemiological, environmental and socio-economic situation, the goal may vary from the reduction of impact to the eradication of a given disease infection or infestation.

In any case, the components of plans for management of outbreaks are an early detection warning system (including a warning procedure), and rapid response and quick and effective action, possibly followed by long-term measures. Plans should always include an exit strategy. Learning from past outbreaks and reviewing the response sequence are critical for adaptation to evolving epidemiological situations and for better performance in future situations. Plans should be tested regularly to ensure that they are fit-for-purpose, practical, feasible and well-understood and that field staff are trained and other stakeholders are fully aware of their respective roles and responsibilities in implementing the response. This is especially important for diseases that are not present in the Member Country.

Article 4.Y.1.

Legal framework and regulatory environment

1) In order to be able to effectively control emerging diseases and listed diseases, the Veterinary Authority should ensure that:
   - the Veterinary Services comply with the principles of Chapter 3.1., especially the services dealing with the prevention and control of contagious animal diseases, including zoonoses;
   - the veterinary legislation complies with the principles of Chapter 3.4.

2) In particular, in order for the Veterinary Services to be the most effective when combatting animal disease
outbreaks, the following should be addressed in the veterinary legislation or other relevant legal framework:

- legal powers and structure of command and responsibilities, including responsible officials with defined powers; especially a right of entry to establishments or other related enterprises such as live animal markets, slaughterhouses/abattoirs and animal products processing plants, for regulated purposes of surveillance and disease control actions, with the possibility of obliging owners to assist;

- sources of financing for epidemiological enquiries, laboratory diagnostic, disinfectants, insecticides, vaccines and other critical supplies;

- sources of financing and compensation policy for livestock and property that may be destroyed as part of disease control programmes;

- coordination with other authorities, especially law enforcement and public health authorities.

3) Furthermore, the specific regulations, policies, or guidance on disease control activities policies should include the following:

- risk analysis to identify and prioritise potential disease risks, including a regularly updated list of notifiable diseases;

- definitions and procedures for the reporting and management of a suspected case, or confirmed case, of an emerging disease or a listed disease;

- procedures for the management of infected establishments directly or indirectly affected by the disease, infected establishment, contact establishment;

- definitions and procedures for the declaration and management of infected zones and other zones, such as free zones, protection zones, containment zones, or less specific ones such as zones of intensified surveillance;

- procedures for the collection, transport and testing of animal samples;

- procedures for animal identification and the management of animal identification systems, the identification of animals;

- procedures for the restrictions of movements, including possible standstill or compulsory veterinary certification, of relevant animals and animal products within, to, or from given zones or establishments or other related enterprises;

- procedures for the destruction or slaughter and safe disposal or processing of infected or potentially infected animals, including relevant wildlife, and contaminated or potentially contaminated products and materials;

- procedures for compensation for the owners of animals or animal products, including defined standards and means of implementing such compensation;

- procedures for cleaning, disinfection and disinsection of establishments and related premises, vehicles or equipment;

- procedures for the compulsory emergency vaccination or treatment of animals, as relevant, and for any other necessary disease control actions.
Article 4.Y.3.

Preparedness

Rapid and effective response to a new occurrence or emergence of contagious diseases is dependent on the level of preparedness. The Veterinary Authority should integrate preparedness planning and practice as one of its core functions. Rapid, effective response to a new occurrence or emergence of contagious diseases is dependent on the level of preparedness.

Preparedness should be justified by risk analysis, should be planned, and should include training, capacity building and simulation exercises.

1. Risk analysis

Risk analysis, including import risk analysis, in accordance with Chapter 2.1., should be used to determine which diseases require preparedness planning and to what extent.

A risk analysis identifies the pathogenic agents that present the greatest risk and for which preparedness is most important and therefore helps to prioritise the range of disease threats and categorise the consequent actions. It also helps to define the best strategies and control options.

The risk analysis should be reviewed updated regularly to detect changes (e.g. new pathogenic agents, or changes in distribution and virulence of pathogenic agents previously identified as presenting the major risk and changes in possible pathways) and be updated accordingly, taking into account the latest scientific findings.

2. Planning

Four kinds of plans, describing what governmental or local authorities and all stakeholders should do, comprise any comprehensive preparedness and response system:

a) a preparedness plan, which outlines what should be done before an outbreak of an emerging disease or a notifiable disease occurs;

b) a response or contingency plan, which details what should be done in the event of an occurrence of an emerging disease or notifiable disease, beginning from the point when a suspected case is reported;

c) a comprehensive set of instructions for field staff and other stakeholders on how to undertake specific tasks required by the response or contingency plan;

d) a recovery plan for the safe restoration of normal activities, possibly including procedures and practices modified in light of the experience gained during the management of the outbreak.

3. Simulation exercises

The Veterinary Services and all stakeholders should be made aware of the sequence of measures to be taken in the framework of a contingency plan through the organisation of simulation exercises, mobilising a sufficient number of staff and stakeholders to evaluate the level of preparedness and fill possible gaps in the plan or in staff capacity.


Surveillance and Early warning detection system

1) Depending on the priorities identified by the Veterinary Authority, Veterinary Services should implement adequate surveillance for listed diseases in accordance with Chapter 1.4. or listed disease-specific chapters, in order to detect suspected cases and either rule them out or confirm them. The surveillance should be adapted to the epidemiological and environmental situation. Early warning systems should be in place for infections or infestations for which a rapid response is desired, and should comply with the relevant articles of Chapter 1.4. Vector surveillance should be conducted in accordance with Chapter 1.5.

2) In order to implement adequate surveillance, the Veterinary Authority should have access to good diagnostic capacity. This means that the veterinarians and other relevant personnel of the Veterinary Services have
adequate knowledge of the disease, its clinical and pathological manifestation and its epidemiology, and that laboratories approved for the testing of animal samples for the relevant diseases are available.

3) Suspected cases of notifiable diseases should be reported without delay to the Veterinary Authority, ideally with the following information:

- the disease or pathogenic agent suspected, with brief descriptions of clinical signs or lesions observed, or laboratory test results as relevant;
- the date when the signs were first noticed at the initial site and any subsequent sites;
- the names and addresses or geographical locations of suspected infected establishments or premises;
- the animal species affected, including possible human cases, and the approximate numbers of sick and dead animals;
- initial actions taken, including biosecurity and precautionary movement restrictions of animals, products, staff, vehicles and equipment;

4) Immediately following the report of a suspected case, investigation should be conducted by the Veterinary Services, taking into account the following:

- biosecurity to be observed when entering and leaving the establishment, premises or locality;
- clinical examinations to be undertaken (number and types of animals);
- samples to be taken from animals showing signs or not (number and types of animals), with specified sampling and sample handling equipment and sample handling procedures, including for the safety of the investigator and animal owners;
- procedure for submitting samples for testing;
- size of the affected establishment, premises or locality and possible entry pathways;
- investigation of the approximate numbers of similar or possibly susceptible animals in the establishment and its surroundings;
- details of any recent movements of possibly susceptible animals or vehicles or people to or from the affected establishments, premises or locality;
- any other relevant epidemiological information, such as presence of the suspected disease in wildlife or abnormal vector activity;

A procedure should be in place for reporting findings to the Veterinary Authority and for record keeping.

5) All suspected case investigations should provide a result, either positive or negative. Criteria should be established in advance for a case definition. Confirmation can be made on clinical and post-mortem grounds, epidemiological information, laboratory test results or a combination of these, in accordance with relevant articles of the Terrestrial Code or Terrestrial Manual. Strong suspicion based on supportive, but not definitive, findings should lead to the implementation of local control measures as a precaution. When a case is confirmed, full sanitary measures should be implemented as planned.

6) When a case of a listed disease is detected, notification shall be made to the OIE in accordance with Chapter 1.1.
Article 4.Y.5.

General considerations when managing an outbreak

Upon confirmation of an outbreak of an emerging disease or a notifiable disease that is subject to an official control programme, effective risk management depends on the application of a combination of measures that are operating at the same time or consecutively, aimed at:

1) eliminating the source of pathogenic agent, through:
   - the killing or slaughter of animals infected or suspected of being infected, and safe disposal of dead animals and potentially contaminated products;
   - the cleaning, disinfection and, if relevant, disinsection of premises and equipment;
2) stopping the spread of infection, through:
   - movement restrictions on animals, vehicles and equipment, and people, as appropriate;
   - biosecurity;
   - vaccination, treatment or culling of animals at risk;
   - communication and public awareness.

Different strategies may be chosen depending on the epidemiological, environmental, economic and social situation. The Veterinary Authority should assess the situation beforehand and at the time of the outbreak detection. For example, the wider the spread of the disease and the more locations affected at the beginning of the implementation of the measures, the less likely it will be that culling as a main eradication tool will be effective, and the more likely it will be that other control tools such as vaccination or treatment, either in conjunction with culling or alone, will be needed. The involvement of vectors or wildlife will also have a major influence on the control strategy and different options chosen.

In any case, the management plan should consider the costs of the measures in relation to the benefits expected, and should at least integrate the compensation of owners for losses incurred by the measures.

In case of highly contagious or high impact disease events, the management plan should be closely coordinated through an inter-sectoral mechanism such as an incident command system.


Culling and disposal of dead animals and animal products

Living infected animals can be the greatest source of pathogenic agents. These animals may directly transmit the pathogenic agent to other animals. They may also cause lead to indirect infection through the contamination of fomites, including breeding and handling equipment, bedding, feed, vehicles, and people's clothing and footwear, or the contamination of the environment. Although carcasses may remain contaminated for a period after death, active shedding of the pathogenic agent effectively ceases when the animal is killed or slaughtered. Thus, culling of animals is often the preferred strategy for the control of contagious diseases.

Veterinary Services should adapt any strategy for culling, killing or disposal of animals and their products to the transmission pathways of the pathogenic agent. A stamping-out policy should be the preferred strategy for highly contagious diseases and for situations where the country or zone was formerly free or freedom was impending, while other strategies, such as test and cull, are better suited to less contagious diseases and situations where the disease is endemic.

For control measures, including destruction of animals or products, to be most effective, animal identification and animal traceability should be in place, in accordance with Chapters 4.1. and 4.2.

The slaughter or killing of animals should be performed in accordance with Chapters 7.5. or 7.6., respectively.
The disposal of dead animals and their potentially contaminated products should be performed in accordance with Chapter 4.12.

1. **Stamping-out policy**

A stamping-out policy consists primarily in the killing of all the animals affected or suspected of being affected, including those which have been directly or indirectly exposed to the causal pathogenic agent. This strategy is used for the most contagious diseases.

A stamping-out policy can be limited to the affected establishments and, where appropriate, other establishments found to be epidemiologically linked with an affected establishment, or be broadened to include all establishments of a defined zone, when pre-emptive depopulation can be used to stop the transmission of a fast spreading pathogenic agent.

A stamping-out policy can be applied to all the animal species present on affected premises, or to all susceptible species, or only to the same species as the infected animals, based on the assessment of associated risks.

Killing should preferably be performed on site, and the carcasses disposed of on site or transported directly and safely to a rendering plant or other dedicated site for destruction. If to be killed outside of the establishment or slaughtered, the animals should be transported directly to a dedicated approved rendering plant or slaughterhouse/abattoir respectively, without any possible direct or indirect contacts with other animals. Slaughtered animals and their products should be processed separately from others.

Stamping out can be applied to all the animal species present on affected premises, or to all susceptible species, or only to the same species as the affected animals.

Products originating from killed or slaughtered animals, ranging from carcasses, meat, milk, eggs or genetic material to hair, wool, feathers or manure, slurry should be destroyed or processed in a way that inactivates the pathogenic agent. The inactivating process should be carried out in accordance with the relevant articles of the listed disease-specific chapters.

Stamping-out procedures systematically include the cleaning and disinfection of establishments and vehicles used for the transport of animals, carcasses or products, as well as of any equipment and material that has been in direct or indirect contact with the animals. The procedures may include disinsection or disinfestation in the case of vector-borne disease or parasitic infestation. These procedures should be conducted in accordance with the relevant articles of Chapter 4.13.

2. **Test and cull**

This strategy consists primarily of finding the proven infected animals in order to remove them from the population and either slaughter or kill and dispose of them. This strategy is used for less contagious or slow-spreading diseases. Veterinary Services may apply different test and cull strategies based on the epidemiology of the infection or infestation or on the characteristics of available diagnostic tests. In particular, the design of test and cull strategy will depend on the sensitivity and specificity of the tests.

Apart from the selection of animals to be culled, the same principles apply as for stamping-out in terms of processing, treatment and disposal of dead or slaughtered animals and their products.
Article 4.Y.7.

Movement control

Disease spread due to the movement of live animals, animal products and contaminated material should be controlled by movement restrictions that are adequately enforced.

These restrictions can be applied to one or more animal species and their associated products, and to people, vehicles and equipment. They may vary from pre-movement certification to total standstill, and be limited to one or more establishments, or cover specific zones, or the entire country. The restrictions can include the complete isolation of individual animals or group of animals, and specific rules applied to movements, such as protection from vectors.

Specific rules covering movement controls should apply to each of any defined zones. Physical barriers should be installed as needed, to ensure the effective application of movement restrictions.

Movement controls should be in place until the end of other disease control operations, e.g. such as a stamping-out policy, and after surveillance and a revised risk assessment has demonstrated they are no longer needed.

Veterinary Services should coordinate their movement control actions with other relevant authorities such as local authorities, law enforcement agencies and communication media, as well as with neighbouring countries in the case of transboundary animal diseases.

Article 4.Y.8.

Biosecurity

In order to avoid the spread of the pathogenic agent outside of the affected establishments or infected zones, and in addition to the management measures described in Articles 4.Y.5. to 4.Y.7., biosecurity should be applied, in particular measures to avoid the contamination of people's clothes and shoes, of equipment, of vehicles, and of the environment or anything capable of acting as a fomite.

When disinfection is applied, specific disinfectant solutions should be used for footbaths or disinfectant baths for vehicles' wheels. Single use material and clothes or material and clothes that can be effectively cleaned and disinfected should be used for the handling of animals and animal products. Protection of premises from wildlife should be ensured. Wastes, waste-water and other effluents should be collected and treated appropriately.


Vaccination and treatment

Vaccination in response to a contagious disease outbreak should be conducted in accordance with Chapter 4.X.

Vaccination in response to an outbreak requires previous planning to identify potential sources of vaccine, including vaccine banks, and to plan the possible strategies for application, such as emergency vaccination or ring vaccination.

The properties of the vaccines should be well understood, especially the level of protection against infection or disease and the possibility to differentiate the immune response produced by the vaccine from that produced by infection with the pathogenic agent.

Although vaccination may hide ongoing infection or agent transmission, it can be used to decrease the shedding of the pathogenic agent, hence reduce the reproductive rate of the infection. In particular, when stamping-out is not feasible, vaccination can be used to reduce the circulation of the infection until levels are low enough for a test and cull strategy.

Whenever vaccination is to be used as a tool to control outbreaks or spread of disease, the control plan should include an exit strategy, i.e. when and how to stop the vaccination or whether vaccination should become routine.
Zoning

The Veterinary Authority should use the tool of zoning in accordance with Chapter 4.3.

The use of zoning for disease control is inherently linked with measures of killing or slaughter, movement control, vaccination and surveillance, which apply differently according to the zones. In particular, efforts should be concentrated on those parts of a territory affected by the disease, to prevent the spread of the pathogenic agent and to preserve the status of the parts of the territory not affected by the disease.

Zones established defined in response to outbreaks of emerging diseases or listed diseases may be are usually infected zones, protection zones, and containment zones. However, other types of zones, such as zones of intensified surveillance, or zones of intensified vaccination can also be used.

Communication in outbreak management

For the best implementation of disease control measures, Veterinary Services should ensure good communication with all concerned stakeholders, including the general public. This should be carried out, among others, through awareness campaigns targeted at breeders, veterinarians, veterinary paraprofessionals, local authorities, consumers and general public.

Veterinary Services should communicate before, during and after outbreaks, in accordance with Chapter 3.3.

Specific post-control surveillance

Specific surveillance should be applied in order to monitor the effectiveness of the official control programme plan, and assess the status of the remaining animal populations in the different zones established by the Veterinary Services.

The results of this surveillance should be used to reassess the measures applied, including reshaping of the zones and re-evaluation of the culling or vaccination strategies, and for the eventual recovery of free status, if possible.

This surveillance should be conducted in accordance with Chapter 1.4. and with the relevant articles of the listed disease-specific chapters.

Further outbreak investigation, monitoring, evaluation and review

In order to gather information required for any management information system, Veterinary Services should conduct an in-depth epidemiological investigation of each outbreak to build up a detailed first-hand, field-based knowledge of how the disease is transmitted, and inform further disease control plans. This requires staff who have been trained in the way to conduct it and the use of the standardised data collection forms.

Information gathered and experience gained should be used to monitor, evaluate and review disease official control programmes plans.