Guidelines for Animal Disease Control

1. Introduction and objectives

The guidelines are intended to help countries identify priorities, objectives and the desired goal of disease control programmes. Disease control programmes are often established with the aim of eventual eradication of agents at a country, zone or compartment level. While this approach is desirable, the needs of stakeholders may require a broader range of outcomes. For some diseases, eradication may not be practically or economically feasible and options for sustained mitigation of disease impacts may be needed. It is important to clearly describe the programme goals and these may range from simple mitigation of disease impacts to progressive control or eradication of the disease. These guidelines highlight the importance of economic assessment of disease intervention options in the design of programmes taking into consideration effectiveness, feasibility of implementation, as well as costs and benefits. The purpose is to provide a conceptual framework that can be adapted to a particular national and epidemiological context.

These guidelines are intended to help countries in the development and implementation of a specific disease control programme that includes objectives, policies and strategies adapted to the full range of national needs. Specific outputs of this process will include the rationale for establishing a disease control programme, strategic goal and objectives, a control programme plan and implementation (Figure 1).
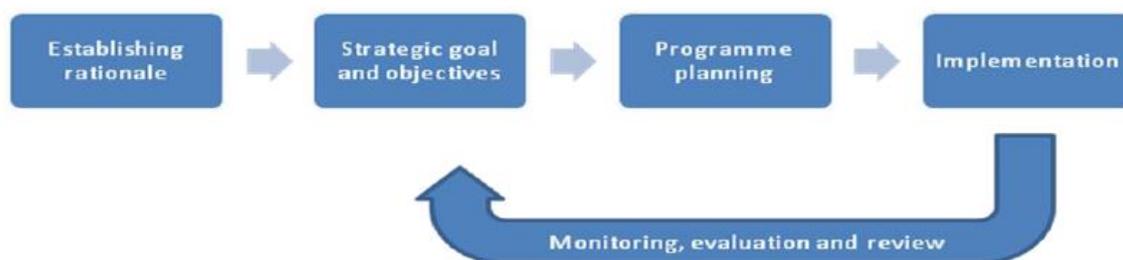

Figure 1 – Steps for establishing a disease control programme

2. Rationale for establishing a disease control programme

The country should clearly state the rationale for establishing a disease control programme. In addition to animal health, consideration should be given to public health, food safety, food security, biodiversity and socioeconomic aspects.

The justification for the disease control programme should summarise current knowledge about the epidemiological situation within the country, providing detailed information on:

1. the disease situation
2. disease impacts (animal and public health, food safety, food security, biodiversity and socioeconomic impact) and how these are distributed among stakeholders
3. identity, level of interest and involvement of stakeholders

3. Control programme goal and objectives

The desired goal of a disease control programme should be defined from the outset. Although eradication has traditionally been the goal for many disease control programmes it may not always be achievable. The epidemiology of the disease including its zoonotic potential, along with the availability of technical tools as well as public health, social, environmental and economic considerations should dictate whether eradication is achievable or whether control at a certain prevalence is the desired endpoint. In certain situations, the emphasis of a programme should be on reducing the health and economic impact of the disease. In other cases it may be concluded that a programme is not feasible or cost-beneficial. Specific objectives and indicators leading to success of the programme should be established. A specific objective of the programme could be for example the establishment of a compartment or a free zone.

Some factors to be considered in defining the goal of disease control programmes are listed in Table 1. An assessment of these factors should guide the strategic planning and programme implementation.

Biological factors	Availability of technical tools
- Species affected - Zoonotic potential - Genetic stability and diversity of the agent - Distribution and density of susceptible species - Wildlife reservoir - Modes of transmission (e.g. vector transmission) - Transmissibility - Current extent of disease - Survival in the environment - Carrier state	- Diagnostic tests - Vaccines - Treatment - Disinfectants and insecticides - Disposal facilities - Trained personnel
Control measures	**Socioeconomic considerations**
- Movement control - Stamping-out, slaughter or pre-emptive slaughter - Import or export restrictions - Zoning or compartmentalisation - Herd accreditation - Isolation and quarantine - Cleaning and disinfection - Vector and reservoir control - Treatment of products and by-products - Vaccination and other medical measures	- Cost and benefits of intervention - Availability of resources - Structure of livestock production systems - Public health implications - Logistics and ease of implementation, - Stakeholder engagement - Environmental impact - Political will - Incentives and compensation - Acceptance of the public (e.g. animal welfare implications, culling of animals, destruction of food) - Safe commodities for trade - Governance and institutional arrangements - Distribution of roles and responsibilities - Budget and financial resources planning

Table 1 - Factors to consider in setting achievable goals for a disease control programme

4. Programme planning

The *Veterinary Authority* in collaboration with stakeholders should develop a plan based on the goal of the programme. Intervention options should be based on effectiveness, ease and cost of implementation, and expected benefits by reaching the objectives of the programme. Tools such as value chain analysis may be used to help understand the role of different players within the production system, identify critical control points to target measures and provide an indication on the incentives for and feasibility of implementation of the programme.

In case of zoonotic diseases, close collaboration and coordination with public health authorities is necessary during programme planning and implementation.

The decision on the most appropriate intervention options should take into account cost-benefit considerations as well as zoonotic potential, in conjunction with the likelihood of success of a particular set of disease control measures.

Institutional analysis examines the organisations involved in delivering services and the processes that govern their interaction. This type of analysis would be helpful to inform the strategic planning process and identify areas where a change would enable better programme implementation and facilitate effective collaboration (Figure 2).

Critical path methods can also be considered to improve project management through work breakdown structures and identifying dependencies between activities.

The programme should include an ongoing review to assess the effectiveness of the interventions that are being applied, identify gaps in knowledge and adapt the goals, objectives and methods or actions as required.
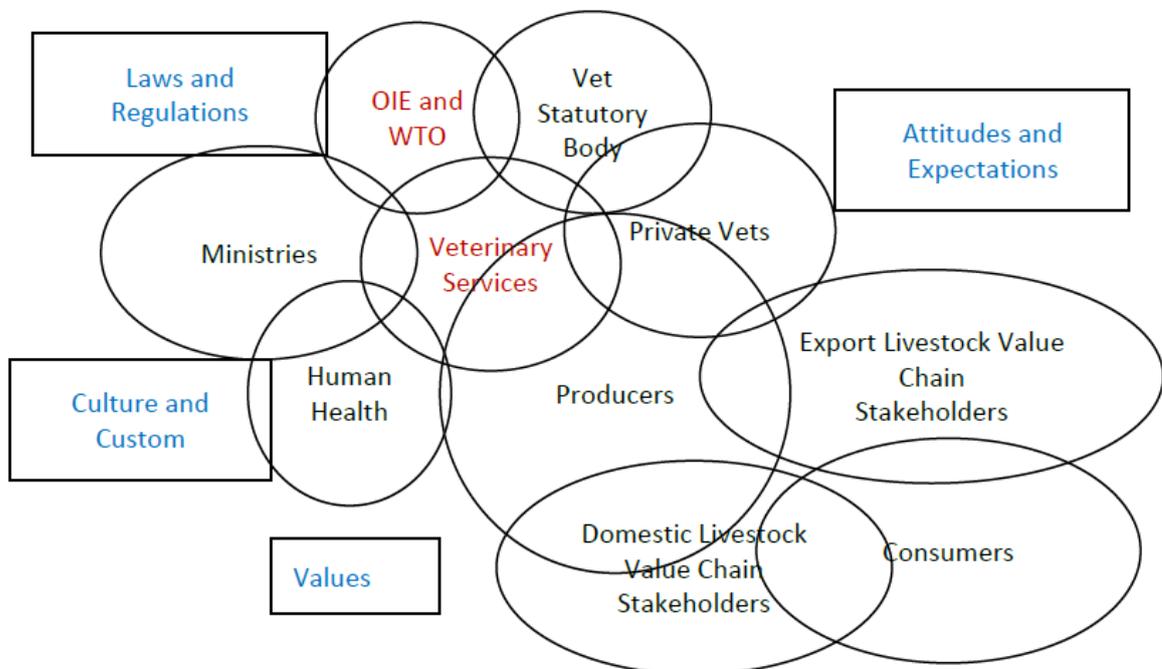

Figure 2 – An example of an institutional map concerning animal health

The programme should take into consideration the distribution of costs and benefits among different stakeholders and understand the factors limiting stakeholder participation in programme activities. These factors can affect the optimal selection of interventions. Programme policies need to include incentives for engagement including, additional services for the producer, appropriate compensation schemes, adding value to the final product and protecting public health. In addition, it may be necessary to include measures to raise awareness and ensure compliance including movement restrictions and fines.

Disease control programme should take into consideration non-financial factors (social, cultural, religious, etc.) affecting the livelihoods and well-being of animal owners such as pastoralists, indigenous communities or small-scale backyard producers. These factors can be important incentives for participation or non-compliance and ultimately impact the success of the programme.

5. Implementation plan

A disease control programme should be based on efficient and effective *Veterinary Services* and the participation of producers and other stakeholders. To ensure good quality of *Veterinary Services*, countries are encouraged to follow the recommendations of Chapter 3.1 and Chapter 3.2 of the *Terrestrial Animal Health Code* (*Terrestrial Code*). A Performance of *Veterinary Services* (PVS) evaluation can also be valuable for identifying and addressing possible gaps within the *Veterinary Services*. In addition, the programme should have political support, and sustainable sources of funding, including government and private stakeholder contributions.

The implementation plan should address the following:

5.1. Regulatory framework

The disease control programme should be supported by effective legislation. Countries are encouraged to follow the OIE standards on *Veterinary legislation* as described in Chapter 3.4 of the *Terrestrial Code.* It is recommended that the disease be notifiable throughout the country. The regulatory framework for the disease control programme should be adapted to evolving programme needs.

5.2. Programme management

While disease control measures to be applied can be implemented by the *Veterinary Authority*, private or community entities or a combination of all, the overall responsibility for oversight of the programme remains with the *Veterinary Authority*.

The application of disease control measures should follow standard operating procedures including:

- implementation, maintenance, monitoring of the measures
- application of corrective actions
- evaluation and verification of the process
- record keeping including information systems and data management

5.3. Epidemiological situation

The implementation of the programme should take into consideration:

- distribution and density of susceptible species including wildlife if applicable
- knowledge of animal production and marketing systems
- spatial and temporal distribution of disease
- zoonotic potential
- factors and critical control points
- vectors
- carriers
- reservoirs
- impact of disease control measures
- specific disease situation in neighbouring countries, if applicable
- the appropriateness of establishing disease zones or compartments

5.4. Disease surveillance

The underpinning of the disease control programme is an effective surveillance system that provides guidance on priorities and targets for the application of interventions. The surveillance system should consist of general surveillance activities reinforced by pathogen specific activities. A clear case definition, outbreak investigation and response procedures are required. The provisions of Chapter 1.1 on *Notification of disease and epidemiological information*, Chapter 1.4 on *Animal health surveillance* and Chapter 1.5 on *Surveillance for arthropod vectors of animal diseases* in the *Terrestrial Code*, should be referred to as well as specific surveillance guidelines where applicable. The Figure 3 below describes the main components of an effective surveillance system.
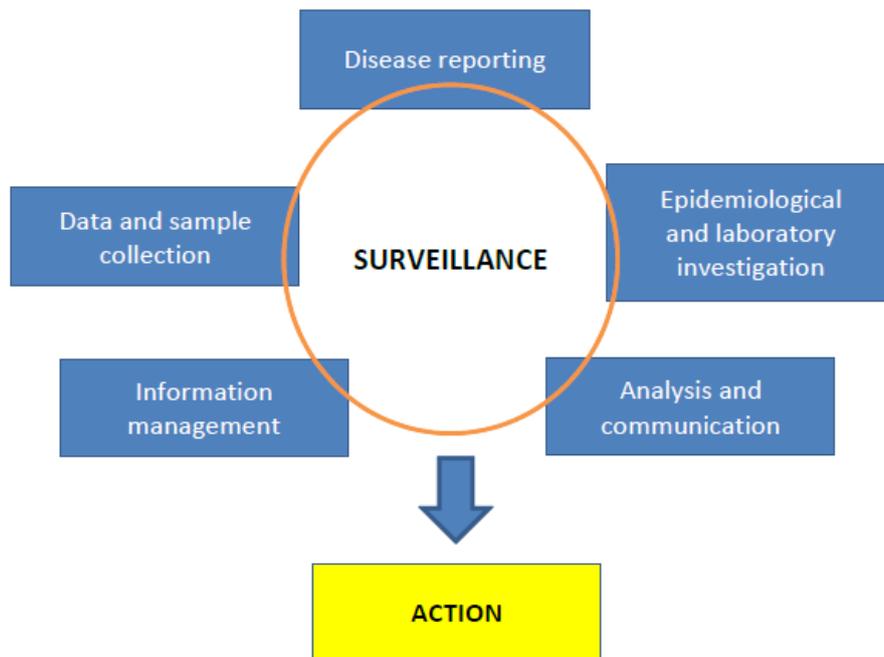
Figure 3 – Essential components of a surveillance system

5.5. Diagnostic capability

The programme should be supported by diagnostic facilities with adequate capability and capacity. Samples for diagnosis should be collected and transported in accordance with Chapter 1.1.1 Collection, submission and storage of diagnostic specimens and Chapter 1.1.2 Transport of specimens of animal origin of the *OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* (*Terrestrial Manual*). Diagnostic tests should follow the specific requirements in Chapter 1.1.5 on *Principles and methods of validation of diagnostic assays for infectious diseases* and the disease specific recommendations in the *Terrestrial Manual*. Diagnostic facilities, either official or accredited, should be under a quality assurance scheme coordinated by the designated national reference laboratory. The latter should establish communication with an OIE reference laboratory for the particular disease. National and sub-national laboratories should ensure that diagnostic results are communicated to the *Veterinary Authority* as appropriate to the situation. National laboratories are also needed to provide independent and impartial quality control of vaccines. When appropriate, national laboratories are encouraged to submit samples to OIE reference laboratories for confirmation of findings and more detailed analysis.

5.6. Vaccination and other control measures

Vaccination is useful in the control of many diseases, if it conforms to the country's effective disease control programme. However, vaccination on its own will not usually achieve the desired results unless the vaccination programme is part of an integrated control strategy utilizing a combination of control measures. If vaccination is applied the following points should be considered:

a) Role of vaccination

Depending on the epidemiological situation, the pattern of animal movements, the occurrence of wildlife reservoirs, population density and production systems within the country, targeted vaccination may be more effective than systematic mass vaccination. Vaccination campaigns should include serological monitoring of the vaccine for effectiveness. Vaccinated animals should be adequately and permanently marked to allow traceability when relevant in the context of the control programme. When a validated strategy to differentiate infected and vaccinated animals (DIVA) is available, its use should be considered.

b)   Vaccine quality

A vaccine quality assurance programme ensures the purity, safety, potency and efficacy of vaccines. Vaccines used within control programmes should be licensed under the authority of the *Veterinary Authority*.

c)   Vaccine delivery

Effective delivery of vaccine, including maintenance of the cold chain and proper administration, is essential for achieving an adequate level of population immunity. This could require the implementation of governmental and/or private schemes that include quality assurance controls of vaccine distribution.

d)   Vaccine and antigen banks

Vaccine and antigen banks could be useful to ensure that sufficient stocks are available. Such vaccine and antigen banks may be held at national or regional levels and should comply with the provisions of Chapter 1.1.10 on *International standards for vaccines banks* of the *Terrestrial Manual*.

e)   Other measures

Regardless of whether vaccination is used or not, a disease control programme should utilize a mix of control measures and tools. Several measures frequently applicable in a disease control programme are listed in Table 1.

5.7.   Traceability

An effective traceability system facilitates the identification of affected animals, herds or flocks. Its design should follow the provisions of the *Terrestrial Code* in particular, Chapter 4.1 on *General principles on identification and traceability of live animals* and Chapter 4.2 on *Design and implementation of identification systems to achieve animal traceability*.

5.8.   Regional cooperation

Transboundary animal diseases require a regional approach to disease control. Regional and inter-sectorial agreements, including the *Veterinary Authority* in each country and representatives of international and other relevant regional organisations should be established to ensure proper coordination. Where possible, countries should act on a regional basis to harmonise disease control programmes.

5.9.   Social participation

Communication and awareness programmes should be in place. Stakeholders should be involved in the development, planning, implementation, management and revision of the programme.

5.10.   Role of research in support of disease control programme

During the strategic planning and assessment of programmes, areas needing further research may be identified. Communication with national and international research institutions should be established to address programme needs.

5.11.   Training and capacity building

Institutional capacity building is important in the development of systems and infrastructure. The personnel in charge of implementing the programme should be appropriately trained and familiar with current knowledge of the disease. Accreditation schemes for private veterinarians and veterinary para-professionals can be useful to increase the veterinary presence in the field, however training and supervision should be coordinated by the *Veterinary Authority*.

6. Outbreak investigation

An outbreak investigation is a systematic procedure to identify the source of cases of infection with a view to control and prevent possible future occurrence. Outbreak investigation is an important responsibility of the *Veterinary Services* to ensure that preventive and control measures are applied. Investigations help to recognise intervention strategy failures and successes, identify changes in the agent, environment or events that may be beyond the scope of a disease control programme. It is important to maintain records of outbreak investigations including those in which the disease was not confirmed as this demonstrates the effectiveness of the surveillance system. In case of zoonosis the outbreak investigation should be done in coordination with public health authorities.

The main steps of outbreak investigation include:

- preparation for field work

- coordination with public health competent authorities in case of zoonosis

- confirmation of the report triggering the investigation

- confirmation of diagnosis

- epidemiological follow-up and tracing

- collection and analysis of data including the animals involved and the spatial and temporal distribution

- implementation of control and preventive measures

- documentation and reporting

A field investigation often entails carrying out several of these steps simultaneously. In the flowchart below, two pathways are possible after the clinical investigation (Figure 4). If in the context of the disease control programme, clinical and epidemiological information may be sufficient to take action and no further laboratory investigation may be required. On the other hand, if the information is inconclusive, further laboratory and epidemiological investigation are needed. Control measures are usually implemented from the beginning of the investigation and modified as appropriate during the process. Laboratory characterisation of the agent may be important to the long term management of the programme.
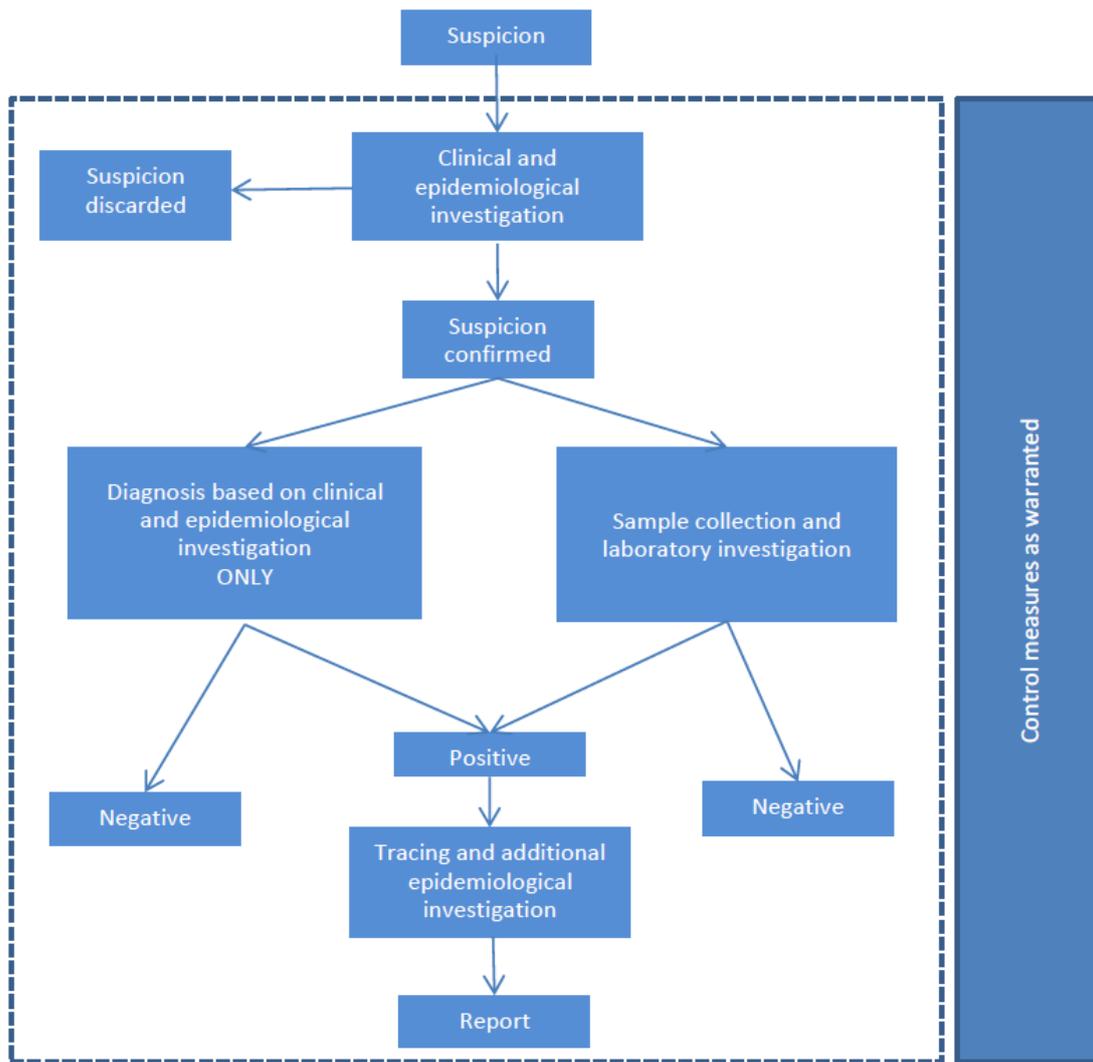
Figure 4 – Flowchart of the outbreak investigation process

7. Emergency preparedness and contingency planning

Countries should develop emergency preparedness and contingency plans for immediate action for diseases fulfilling the provisions of Article 1.1.3.1. of the *Terrestrial Code*. Emergency response plans should be up to date, tested for example in a simulation exercise and embedded in the legal framework. Emergency funds should be available to cover operational costs and indemnities. The chain of command and coordination with all key players and relevant support services when necessary should be well established to ensure control efforts are executed rapidly and with success.

A contingency plan is a set of activities, including immediate actions and longer term measures, for responding to an animal health emergency such as disease outbreaks. The process of developing a contingency plan involves organising a team representing relevant authorities and stakeholders, identifying critical resources and functions, and establishing a plan for recovery. The plan should be simple and implementable. It must be documented, tested and updated regularly. The plan should be prepared by the *Veterinary Authority*, with the involvement of representatives from the local governments, relevant agencies, private sectors and public health competent authorities in case of zoonosis. Key components in a contingency plan include:

- established chain of command
- systems for rapid detection and confirmation

- outbreak investigation procedures
- rapid containment measures (e.g. movement control, disinfection, vaccination, culling)
- communication strategy

Notification on disease confirmation should be immediately sent to other appropriate ministries, trading partners, and stakeholders and should generally be made available to the public. In addition, notification to the OIE should follow the provisions of Chapter 1.1 of the *Terrestrial Code*.

Following the confirmation of an outbreak, control areas may be established around the affected premises. The extent of these areas depends on a number of factors, in particular, the epidemiology of the disease. The measures imposed in these control areas will often include movement restrictions, intensified surveillance and specific measures applied to affected premises. In addition, for ease of management and for trade purposes, a larger area surrounding the control areas may be designated corresponding to administrative or geographical boundaries (Figure 5).
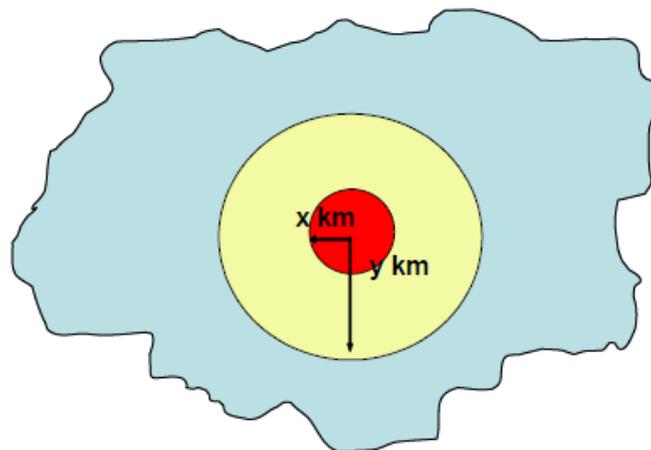
**Figure 5 – Illustration of movement control areas centred on a disease outbreak
indicating an infected zone around an outbreak**

Disease control measures usually have a significant economic impact; therefore, appropriate compensation mechanisms should be in place to ensure cooperation by farmers. Lack of compensation could lead to non-compliance. Partnerships between government and the private sector have proven effective to develop sustainable contingency funds in some countries.

The contingency plan should be coordinated on a regional level, particularly for transboundary animal diseases. Detailed guidance and examples of contingency plans are available on the OIE web site (http://www.oie.int/en/animal-health-in-the-world/the-world-animal-health-information-system/national-disease-contingency-plans)

8. Monitoring, evaluation and review

The programme should include an ongoing review to assess the effectiveness of the interventions that are being applied, identify gaps in knowledge and adapt the objectives and methods as required. This process should begin with the establishment of baseline data on the epidemiological, economic and social impact of the disease. The programme should collect data on process and impact indicators. This enables measurement of the effectiveness of interventions on epidemiological indicators such as incidence and prevalence, and identifies areas needing strengthening.

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