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A world map in a light blue color, showing the outlines of continents and countries, serving as a background for the title text.

GLOBAL RINDERPEST ACTION PLAN

A photograph of a herd of cattle grazing in a field, overlaid with a blue tint. The cattle are scattered across the field, some facing left and some facing right.

POST-ERADICATION

GLOBAL RINDERPEST ACTION PLAN

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Foreword

Rinderpest plagued livestock for centuries, spreading through trade and migration routes from Central Eurasia to the Near East, Europe, Africa and Asia. As a result, it caused the death of hundreds of millions of livestock and wild animals, and led to significant disruption and damage to agricultural supply chains throughout the world and to biodiversity. As devastating as it was, rinderpest was also a galvanizing force. It led to the establishment of the World Organisation for Animal Health (OIE) in 1924, and it prompted the creation of veterinary services in countries where such bodies had not existed previously. The Food and Agriculture Organization of the United Nations (FAO) set out its animal health agenda, after its establishment in 1945, with rinderpest as a top priority ever since due to its impact on livelihoods and nutrition.

Rinderpest eradication remains one of the greatest successes for FAO, the OIE and their partners. This extraordinary achievement would not have been possible without the joint efforts and strong commitments of governments and the main regional organizations in Africa, Asia and Europe, and without the continuous support of donors and international institutions.

From 1994 to 2011, FAO spearheaded the Global Rinderpest Eradication Programme (GREP) with strong alliances with the OIE, the International Atomic

Energy Agency (IAEA) and other institutional partners, governments, regional organizations such as the Interafrican Bureau for Animal Resources (AU-IBAR), and communities worldwide. The eradication of rinderpest united countries through a common purpose.

In 2011, FAO and the OIE declared the world free from rinderpest, making it the first animal disease to be eradicated in the history of humankind. However, stores of rinderpest virus containing material remain a threat. Recognizing the enduring risk, the organizations' respective Members asked for the creation of a plan of action to address the re-emergence of the disease, should this occur.

As a result of dedicated efforts in research, consultation and interorganizational collaboration, we are honoured to present the Global Rinderpest Action Plan (GRAP). This document lays out a framework for maintaining global freedom and is designed to complement all other national, regional/continental and international emergency management plans. In addition, it lays out the roles and responsibilities of all relevant stakeholders through all stages of emergency management.

It is only together that we shall ensure rinderpest remains eradicated but not forgotten.

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Edgardo Arza, Steve Weber and Elizabeth Tenborg for their contributions to the annexes and the technical edits. The overall review by FAO and OIE Members and by regional/continental organizations was critically important in designing an appropriate plan for the end users and stakeholders.

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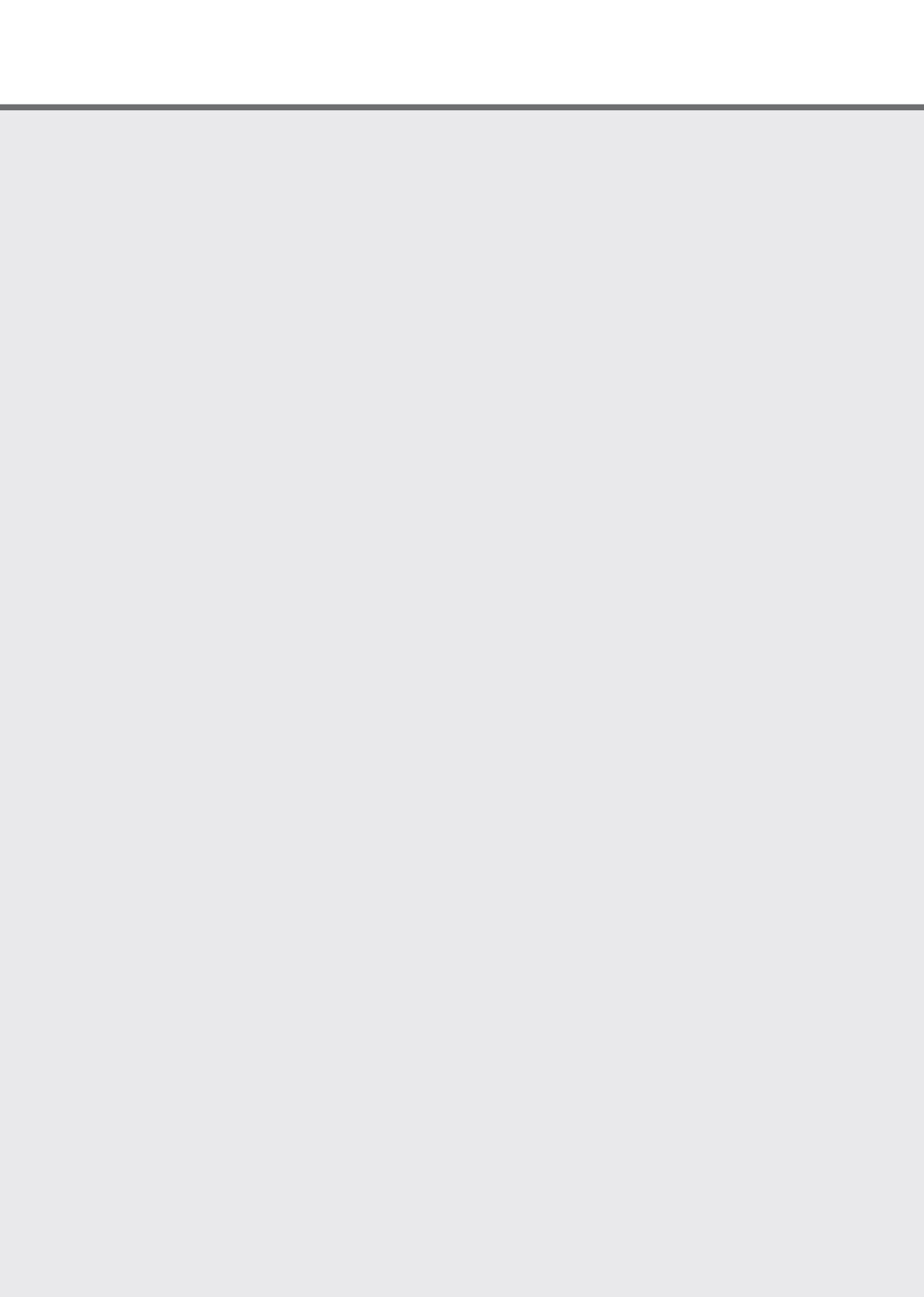
FAO and the OIE acknowledge the financial contributions of Global Affairs Canada (Weapons of Mass Destruction Threat Reduction Program), the United States of America Defense Threat Reduction Agency, and the Government of Japan, which have enabled the preparation and publication of this plan.

Abbreviations and acronyms

AH-EOC	Animal Health Emergency Operations Centre	L3	Level 3 (emergency response)
AU-IBAR	African Union Interafrican Bureau for Animal Resources	NCB	national central bureau
EMC-AH	Emergency Management Centre for Animal Health	NCP	national contingency plan
EMPRES-AH	Emergency Prevention System for Animal Health	OIE	World Organisation for Animal Health
EWEA	Early Warning Early Action	OIE Manual	OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals
FAO	Food and Agriculture Organization of the United Nations	OIE Terrestrial Code	OIE Terrestrial Animal Health Code
GEMP	Good Emergency Management Practice	PPR	Peste des Petits Ruminants
GLEWS	Global Early Warning System	RHF	rinderpest holding facility
GRAP	Global Rinderpest Action Plan	RPV	rinderpest virus
GREP	Global Rinderpest Eradication Programme	Rinderpest Secretariat	Joint FAO–OIE Rinderpest Secretariat
IAEA	International Atomic Energy Agency	RRA	rapid risk assessment
IATA	International Air Transport Association	RVCM	rinderpest virus containing material
INTERPOL	International Criminal Police Organization-INTERPOL	RVR	(global) rinderpest vaccine reserve
JAC	(FAO–OIE Rinderpest) Joint Advisory Committee	SOP	standard operating procedure
		TAD	transboundary animal disease
		WAHIS	World Animal Health Information System
		WHO	World Health Organization

BACKGROUND







For centuries, outbreaks of rinderpest caused the death of millions of cattle, buffalo, yak and wild animals worldwide, resulting in famine and starvation, and the inability of hundreds of thousands of communities to use draught animals to prepare land for crops and pump water for irrigation, or for transport.

The Global Rinderpest Eradication Programme (GREP) of the Food and Agriculture Organization of the United Nations (FAO) worked diligently for 16 years with multiple national, regional/continental and international partners, including the World Organisation for Animal Health (OIE), resulting in the successful eradication of rinderpest in animal populations worldwide in October 2010. A summary can be found in *The Global Effort to Eradicate Rinderpest* (Roeder and Rich, 2009).

GREP activities included: coordinating regional efforts in Africa, Asia and the Near East; training in disease investigations and field surveillance; and assisting countries in complying with the OIE Rinderpest Pathway for recognition of freedom from rinderpest. Rinderpest virus was arguably the first agro-weapon, and it is often listed by organizations as a pathogen that could be maliciously used to cause economic, political and social harm.

“RINDERPEST IS NOW ERADICATED”

Today, ensuring that rinderpest does not re-emerge in animals after global eradication is of great importance to animal health, economies and food security worldwide.

RINDERPEST: THE DISEASE

Rinderpest is an acute, contagious disease that causes high morbidity and mortality in cattle, buffalo, yak and other wildlife species. Classical rinderpest causes

“stomatitis-enteritis syndrome” characterized by erosive oral lesions and diarrhoea. However, clinical signs vary in severity depending on the strain of rinderpest virus as well as on the species and breed of the host.

Global eradication was achieved through the mass vaccination of cattle with live attenuated and thermostable rinderpest vaccine, sero-monitoring of vaccinates, and extensive and prolonged surveillance to demonstrate the absence of rinderpest once vaccination had ceased. Rinderpest remains a notifiable OIE-Listed disease.

WHAT IS UNIQUE ABOUT THE GLOBAL RINDERPEST ACTION PLAN?

The declaration of the global eradication of rinderpest in 2011 was an unprecedented event in the history of animal health – the result of years of focused effort and collaboration at the national, regional/continental and international levels. Therefore, the risk of re-emergence and the action plan to address it are distinct from all other plans targeting transboundary animal diseases (TADs).

Decreasing expertise: It has been more than 16 years since rinderpest was last seen by a farmer or veterinarian in the field. The first line of defence against re-emergence is to keep these communities aware of the disease and its possible re-emergence.

Decreased access to diagnostics and vaccines: The successful eradication of rinderpest prompted the restriction of access to diagnostics and vaccines containing live virus. In the absence of next-generation diagnostics and vaccines that do not contain live rinderpest virus, good planning is now essential to enable rapid access to the original tools, which will be critical for early confirmation and prevention of spread.

Global impact: Should rinderpest re-emerge, the first confirmed case will be immediately recognized as a global emergency. The declaration of an emergency, involving international organizations, will be unique. The immediate goal on engagement at the national, regional/continental and international levels will be to regain global freedom as quickly as possible.

These unique aspects are incorporated with other information and recommendations in the following chapters of the Global Rinderpest Action Plan (GRAP) to ensure that rinderpest remains eradicated but not forgotten.

PURPOSE, SCOPE AND ASSUMPTIONS OF THE GRAP

The GRAP is the international operational plan that complements all other national, regional/continental and international plans for rinderpest. It defines the operational frameworks, the actions to take for rinderpest emergency management, and the assigned responsibility for those actions. The GRAP enables veterinary officials to identify and prioritize gaps in preparation for a potential rinderpest re-emergence. The actions recommended within the GRAP will mitigate risk and strengthen global planning, while providing the necessary confidence for decision makers to proceed with the destruction of remaining virus stocks.

The purpose of the GRAP is to:

- complement and expand on the rinderpest emergency management guidance already in place from FAO, OIE, regional/continental organizations, and countries;
- provide a framework on a national, regional/continental and international basis to reduce the likelihood of rinderpest re-emergence, and to facilitate a coordinated response if re-emergence occurs;
- identify actions beneficial to the five stages of emergency management (Prepare, Prevent, Detect, Respond and Recover) as they relate to the potential re-emergence of rinderpest;

- evaluate the readiness status of a country, region or international organization, and reveal gaps that may need additional support or funding.

The consequences of rinderpest re-emergence are of global importance, and effective response will require cooperation between multiple stakeholders at the national, regional/continental and international levels. The scope of the GRAP is intended to inform and advise a broad range of stakeholders, including but not limited to:

- national government officials (e.g. ministers, chief veterinary officers, animal health managers, national security forces) and other animal health professionals;
- academics (e.g. researchers, educators to enhance awareness) and personnel in laboratories that hold rinderpest virus containing material (RVCM);
- livestock keepers and the private sector;
- regional/continental organization representatives and managers, FAO regional offices, OIE regional offices, regional economic commissions and communities;
- international organization representatives and managers (including FAO and the OIE);
- development partners (e.g. World Bank, national governments, non-governmental organizations, the private sector);
- the law enforcement sector, including international organizations such as the International Criminal Police Organization-INTERPOL (INTERPOL).

The GRAP is based on assumptions pertaining to the current situation of rinderpest management, including the following:

- RVCM, including live vaccines, continues to be held in a number of institutions around the world, and this poses a risk of virus re-introduction into susceptible animals. The first confirmed rinderpest case will lead to the loss of rinderpest-free status for the entire country and the suspension of global rinderpest freedom.
- If confirmed rinderpest-positive animals are reported, the goal is to eradicate the disease as quickly as possible.



STAGES OF THE GRAP

The GRAP provides guidance for critical activities required to address the five stages of emergency management for a potential re-emergence of rinderpest (Figure 1):

- **Prepare:** Actions taken **before** detection of rinderpest, to maintain a state of readiness. Actions should include, among other things, development of a comprehensive emergency management plan for rinderpest to raise awareness and expedite effective response operations. Preparedness planning is essential in order to test the readiness of the network of responders, and to identify gaps and shortfalls that need to be addressed prior to an outbreak. It also includes the identification of funding sources that could be accessed, if needed, to support response and recovery operations.
- **Prevent:** Actions designed to prevent, mitigate the impact, or eliminate the possibility of a rinderpest re-emergence. Preventive mitigation measures can greatly lessen the disruptive impact, reduce the severity of an outbreak, and shorten the Respond stage. Activities must focus on methods to revive and maintain technical expertise as the first line of defence against re-emergence.
- **Detect:** Actions designed to discover or determine the presence of rinderpest virus in animals. Actions include implementation of robust syndromic surveillance efforts at the national level; and sample collection for analysis for the presence of rinderpest virus by FAO and OIE rinderpest reference centres/laboratories. The chapter on infection with rinderpest virus of the OIE Terrestrial Animal Health Code (OIE Terrestrial Code) (OIE, 2017) contains definitions for suspected and confirmed rinderpest cases. Active involvement and dedicated efforts during the Prepare and Prevent stages may enhance the efficiency of the Detect stage.
- **Respond:** Actions **during** an emergency. For rinderpest, early actions in the event of a suspected case are critically important. In the event of a rinderpest outbreak, the emergency response involves

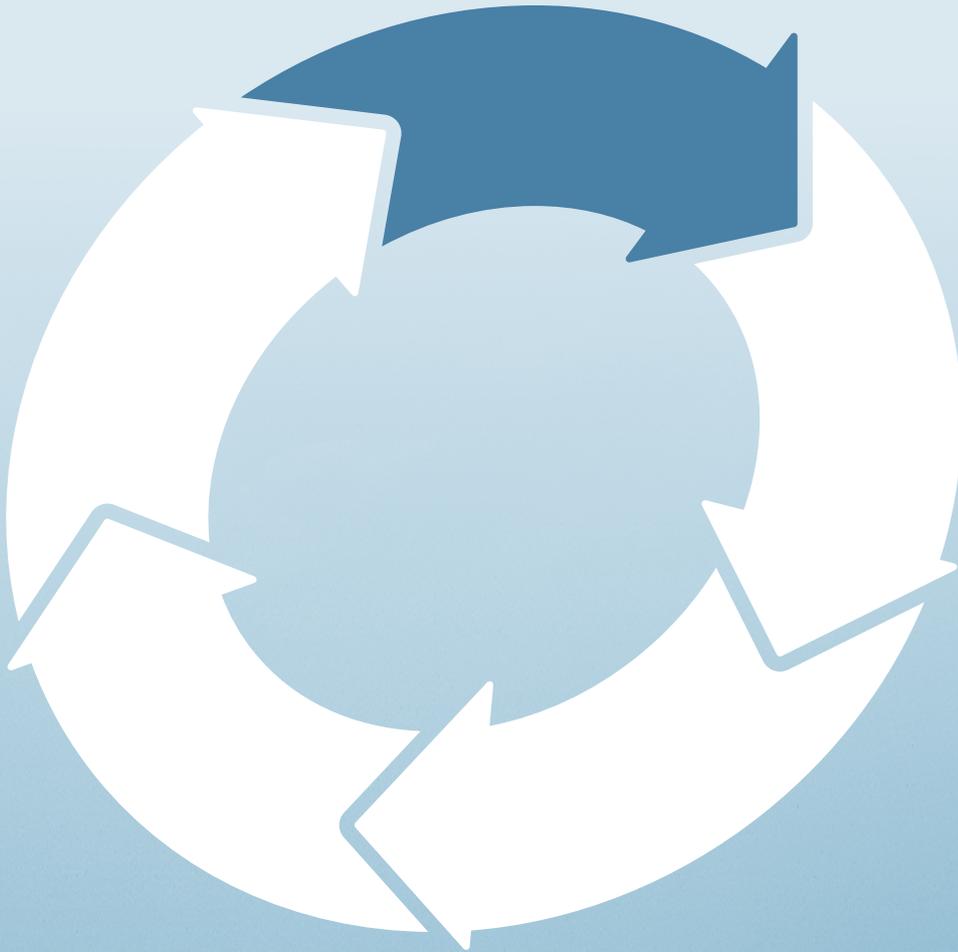
Figure 1. Emergency management cycle

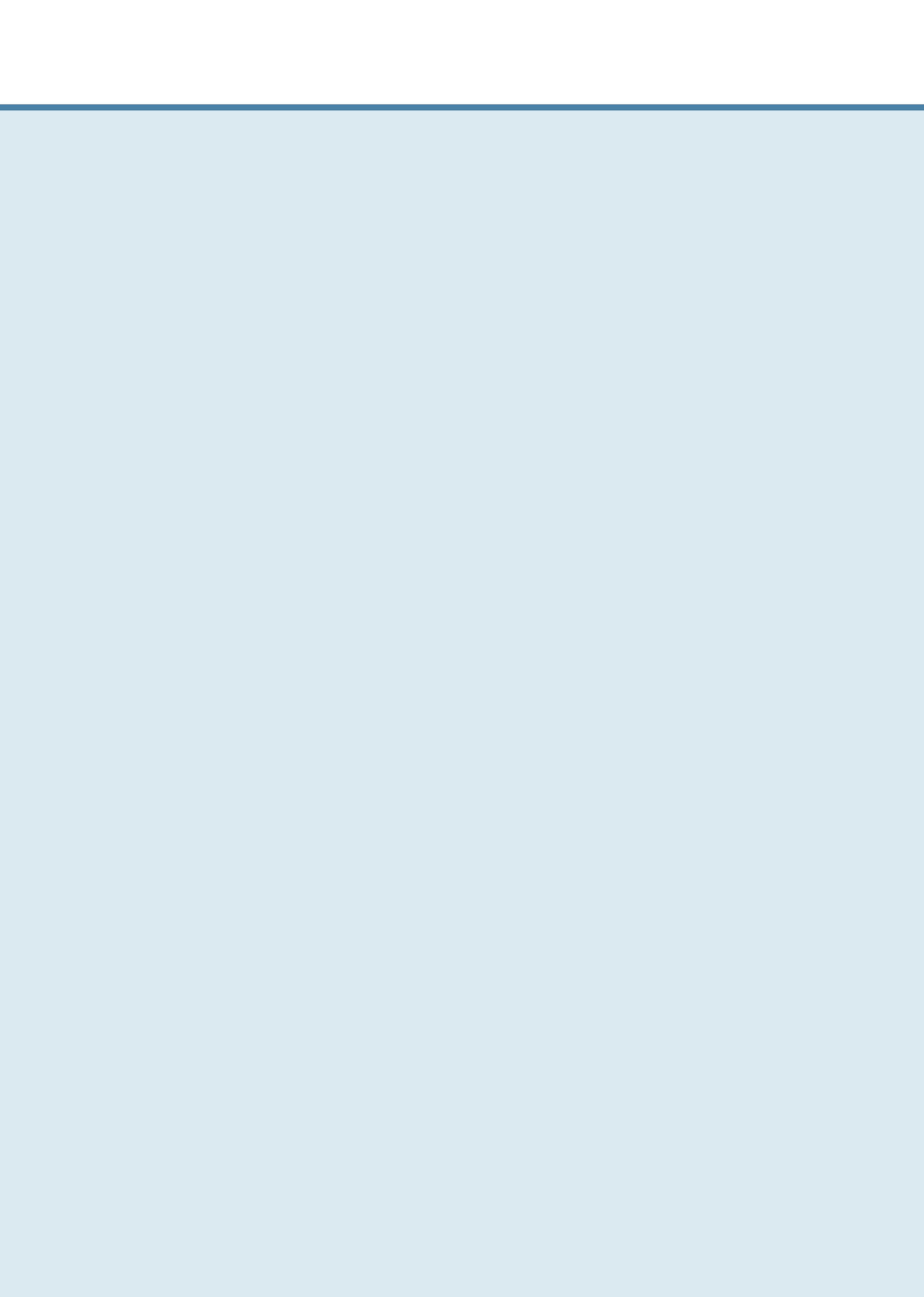


the deployment of emergency responders and the allocation of critical resources (national, regional/continental and international).

- **Recover:** Actions during and immediately **after** the Respond stage, when the immediate concerns for animal health, animal welfare and livelihoods have been addressed. Recovery is the process of restoring the livestock populations and affected communities as well the steps necessary to once again achieve global freedom from rinderpest.

PREPARE







Emergency preparedness is the building of a state of readiness prior to a disease event. Preparedness is critically important in the era of post-rinderpest eradication to maintain vigilance for a potential rinderpest re-emergence at all levels, i.e. national, regional/continental and international. In order to adequately prepare, a continuous series of actions should be implemented to develop/modify plans, and to equip, train and exercise responders (Figure 2). This cycle of actions is applicable for a number of TADs, including zoonoses. Organizations should use the time outside of a response wisely and apply the cyclic series of actions to adequately prepare for each of the remaining four stages of the emergency management cycle: Prevent, Detect, Respond and Recover.

A series of checklists for rinderpest preparedness for national, regional/continental and international stakeholders are listed in Annex 1, and available for download and use from the rinderpest web pages of FAO and OIE (FAO, 2018; OIE, 2018a).

PLANNING

The first action in rinderpest preparedness is to plan. This is followed by other preparedness actions to equip, train and exercise.

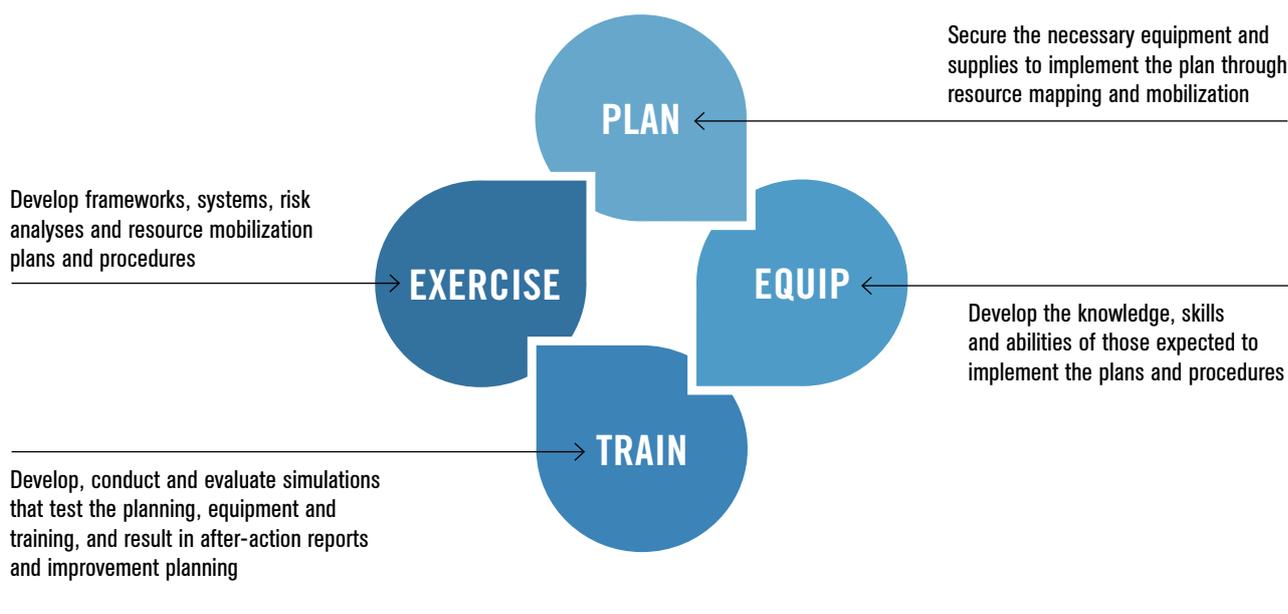
Planning for a possible re-emergence is the first component of preparedness for rinderpest.

NATIONAL ACTIONS FOR PLANNING

Establish governance

The government of each country maintains its independent and legal authority to adopt legislation and accompanying policies and procedures for rinderpest emergency management. All national governments should have the legal powers and framework in place to provide the necessary authority for taking actions to prepare for, prevent, detect, respond to and recover from all transboundary animal diseases including a rinderpest re-emergence.

Figure 2. Emergency preparedness cycle for transboundary animal diseases



A competent incident management system – including incident command to direct activities in the field and incident coordination to manage communication, coordination, policy decisions, and resources – is an essential framework that should be established prior to a response. Establishing governance may require a prolonged period and should be one of the first actions in the preparedness stage.

Analyse risk

Risk analysis is a tool that can provide a solid foundation for decision-making, and it should be undertaken in the early stage of the national planning process. By conducting a risk analysis, national authorities can better understand: where rinderpest would most likely re-emerge based on associated risk factors; the likely magnitude of the associated biological and economic consequences; and how and where systems need to be strengthened to address the gaps. The four components of a risk analysis are: (i) hazard identification (rinderpest virus), (ii) risk assessment, (iii) risk mitigation, and (iv) risk communication.

A scenario-based approach is particularly relevant to conducting a risk assessment, the second component of analysis, because re-emergence is a low-likelihood, high-consequence disease event associated with a large amount of uncertainty. A scenario also helps raise awareness in a practical way and requires that national stakeholders think critically about the risks in their own context. Findings from the risk assessment can be analysed, and plans made at national, regional/continental and international levels to mitigate the risk of rinderpest re-emergence; namely, by sequestering rinderpest virus in designated rinderpest holding facilities (RHF). The findings from the risk assessment can also influence the design of proactive surveillance programmes and in planning control measures, including estimating the number of animals to be culled and/or the number of vaccine doses needed to reduce the spread of infection. Because the perception of risks varies by target audience, an effective risk communication process is needed to bridge the potential gap between how the animal health experts may define risk, and how the public perceives it.

Moreover, risk communication is necessary to meet the high public demand for information during an outbreak. It is important that all arrangements and procedures for communication be put in place prior to an outbreak during the preparedness stage, and that communication plans be practised during simulation exercises.

The national veterinary authority should conduct national risk analyses for rinderpest at regular intervals to guide the necessary updates of the national emergency management plan for rinderpest. A recommended range is about every 2–3 years for countries that hold RVCM, and as needed for other countries, because rinderpest re-emergence risk is greater in a country that holds virus stocks. FAO and the OIE conduct a facility-specific biorisk assessment after a facility applies to become an RHF, and may conduct subsequent re-inspections. If available, this assessment should be incorporated into the national risk analysis.

Manuals that give specific guidance on the process for developing both quantitative and qualitative animal-health-related risk analysis are available (OIE, 2010a).

Develop and update a national emergency management plan for rinderpest

Each country should develop a national plan that addresses the roles, responsibilities and actions of stakeholders in each stage of emergency management. The plan could be a specific plan for rinderpest that addresses actions in each stage of emergency management (like the GRAP), or a generic emergency management or disaster plan for other TADs. If the generic approach is used, countries should consider including a specific annex that addresses the unique emergency management considerations for rinderpest.

The national plan should take into consideration the framework of legal powers, and the results from a national risk analysis. Examples of components that should be fully discussed and planned during preparedness are: a robust syndromic surveillance plan; an immediate reporting mechanism for suspected cases; sample submission to FAO and OIE rinderpest reference centres/laboratories for confirmation; and risk communication. They help ensure that all arrangements are in place prior to an outbreak.



The response component of the plan (i.e. contingency plan) should identify who has responsibility for initiating control activities within written standard operating procedures (SOPs) for critical actions, such as targeted surveillance during response, case investigation and sample collection, “stamping out”, emergency vaccination, accessing resources (diagnostics, vaccine, emergency funding) and other procedures as necessary to support emergency response. More details are provided about the response actions in Chapter 4. In addition, a rinderpest national contingency plan template is available to assist countries in developing their response plan to a suspected and/or confirmed case of rinderpest (FAO, 2011a, 2018; Obi, Roeder and Geering, 1999; OIE, 2018a).

It is critical to continue this planning process throughout the preparedness stage before rapid actions are needed to respond to a suspicion of rinderpest. The national emergency management plan for rinderpest should be consistent with other relevant national plans, (e.g. national plans for other TADs, natural disaster plans).

The FAO maintains a guide to help prepare for animal health emergencies, *Good Emergency Management Practice: The Essentials* (GEMP) (FAO, 2011a). This publication

contains critical principles to assist national veterinary services to standardize and improve countries’ capacities to adequately manage animal disease emergencies.

The structure of the GRAP serves as an example and possible template for a national emergency management plan for rinderpest.

Identify funding sources

Funding sources and the authority to mobilize funds to support the emergency management plan for rinderpest are key components of national planning. Assurance should be provided prior to an outbreak that emergency funds can be rapidly accessed. Other sources of funds or donors may need to be identified and agreements written prior to an outbreak in order to provide funding for necessary national activities.

National emergency management plans should include an estimated budget for their implementation, including funds for responding to an outbreak.

Key national actions for rinderpest planning

Box 1 summarizes the key national actions that countries should implement for rinderpest planning.

Box 1. KEY NATIONAL ACTIONS FOR RINDERPEST PLANNING

- Ensure governance is in place for legal powers and frameworks.
- Conduct a risk analysis.
- Develop a command structure for incident management in the field.
- Develop a facility (animal health emergency operations centre [AH-EOC]) for the central coordination of information, policy and resources to support incident management.
- Develop a sensitive, passive, syndromic surveillance plan.
- Develop a rapid and transparent reporting system for a rinderpest suspected case.
- Develop SOPs for the expedient shipping of diagnostic samples from rinderpest suspected cases to an FAO/OIE reference centre/laboratory.
- Develop the concept of operations for emergency response actions, including early action for rumours.
- Develop SOPs for emergency vaccination for rinderpest.
- Package all actions into a national emergency management plan for rinderpest.
- Ensure access to funding to support the plan.

REGIONAL/CONTINENTAL ACTIONS FOR PLANNING

Regional/continental organizations should develop strategies and plans for rinderpest emergency management that clearly identify the policies and mechanisms for coordination between countries, the availability for sourcing and accessing regional resources, and the assistance their organizations can provide. The impact of the potential re-emergence of rinderpest and the resulting effect on the global status of freedom make it imperative to pre-identify communication protocols between countries on a regional basis.

The African Union Interafrican Bureau for Animal Resources (AU-IBAR) Post Rinderpest Eradication Strategy (AU-IBAR, 2012) is the only formal regional plan currently available. The AU-IBAR, an Institution of the African Union Commission, coordinates planning in close collaboration with the eight African regional economic communities. Significant topical areas in the AU-BAR strategy include:

- lessons learned during the rinderpest eradication programmes;
- descriptive risk analysis of the residual threat of rinderpest;
- reducing the probability of re-emergence through virus sequestration;
- enhancing detection of re-emergence through better disease surveillance;
- standard methods and procedures for the region;
- coordination for integrated activities and rapid response.

Valuable outputs of regional/continental planning are: regional rinderpest vaccine stockpiles, such as that currently available at the Pan African Veterinary Vaccine Centre of the African Union; planning for resource mobilization; and harmony of messages issued by different stakeholders.

All relevant regional/continental organizations are highly encouraged to take a proactive approach to developing rinderpest emergency management strategies and plans, and allocating funding for emergency resource mobilization.

INTERNATIONAL ACTIONS FOR PLANNING

Through approval by their Members, FAO and the OIE have the responsibility for implementing necessary actions to maintain global freedom from rinderpest.

FAO

FAO facilitates synergies with specialized organizations to advocate for development of national, regional/continental and international rinderpest emergency preparedness. The FAO GEMP manual (FAO, 2011a) sets out in a systematic way the elements required to achieve preparedness for any emergency related to disease events in animals. It is the sum of organized procedures, structures and resource management efforts that leads to prevention of disease introduction and mitigation of risks. GEMP also enhances the early detection, prediction of the likely spread, prompt limitation of spread, and targeted control and elimination of disease or infection in an animal population, with subsequent re-establishment of verifiable freedom from infection.

The roles of FAO regional, subregional and country decentralized offices are crucial in their direct work in countries to advocate planning for rinderpest and other TADs.

OIE

The OIE maintains the international standards for rinderpest, including specific chapters in the OIE Terrestrial Code (OIE, 2017) and the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (OIE Manual) (OIE, 2018b). The OIE Terrestrial Code defines RVC and suspected and confirmed cases of rinderpest. It also sets respective responsibilities for countries to carry out general surveillance to detect rinderpest and outlines the response procedures for each re-emergence scenario. The OIE Manual addresses the overview of the disease, available diagnostic techniques, vaccines and vaccine production.

The joint actions of FAO and the OIE are:

- development and implementation of multilevel global action planning;



- facilitation of surveillance systems and national preparedness;
- planning and implementation of other rinderpest-related activities as required.

FAO–OIE Rinderpest Secretariat and Joint Advisory Committee

Recognizing the importance of proactive preparedness and prevention, resolutions were adopted at the Seventy-ninth General Session of the World Assembly of OIE Delegates in May 2011 and the Thirty-seventh FAO Conference in June 2011 calling for the creation of an FAO–OIE Rinderpest Joint Advisory Committee (JAC) with the objective of supporting both organizations in ensuring continued global freedom from rinderpest. A joint FAO–OIE Rinderpest Secretariat (Rinderpest Secretariat) was appointed in March 2012, and the members of the JAC were selected in April 2012. The JAC is comprised of independent experts in animal health, virology, epidemiology, biorisk management, and emergency management. Its function is to advise FAO and OIE on matters pertaining to the handling, storage and transport of rinderpest virus, and on research proposals received by the two organizations. The Rinderpest Secretariat is tasked with coordinating and implementing all activities relevant to the post-eradication era, including: mandates for rinderpest virus sequestration and approval; evaluation of RHF; maintenance of diagnostic capability; vaccine development, production and storage policy; approval of research requests; and emergency management planning. The Rinderpest Secretariat provides all relevant contacts for rinderpest emergency management in Annex 3.

FAO and OIE rinderpest reference centres/laboratories

FAO and the OIE have designated, respectively, reference centres and reference laboratories for rinderpest. These FAO and OIE rinderpest reference centres/laboratories are the only institutions allowed by FAO and the OIE to conduct diagnostics to rule out or confirm rinderpest cases in the post-eradication era. They are required to report their results to FAO, the OIE and the submitting government authority. The currently available confirmatory tests require the use of infectious rinderpest materials and are detailed in the OIE Manual.

At this time, FAO and OIE rinderpest reference centres/laboratories include: the French Agricultural Research Centre for International Development; The Pirbright Institute, in the United Kingdom of Great Britain and Northern Ireland; and the National Institute of Animal Health, in Japan. The terms and conditions of FAO and OIE rinderpest reference centres/laboratories clearly define their roles and responsibilities. FAO and the OIE maintain a list of approved centres and laboratories on their respective websites (see also Annex 3).

FAO–OIE rinderpest holding facilities

Upon declaration of global freedom from rinderpest in 2011, FAO and OIE Members called for the approval of a minimum number of facilities to hold RVCM and for a reduction in the remaining rinderpest virus stocks. FAO and the OIE jointly develop guidelines and SOPs to govern the maintenance of the stocks and ensure their availability for emergency purposes – Operational Framework for the Management and Deployment of the Rinderpest Vaccine Reserve (Annex 2). The mechanism for designation of RHF is described in Chapter 2.

Rinderpest vaccine reserves

The Global Rinderpest Vaccine Reserve (RVR) is necessary to support an outbreak response if re-emergence occurs. The global vaccine stockpile is available to all countries affected by an outbreak of rinderpest. The process for countries to request vaccine through FAO and the OIE is described in Chapter 4, with more detail in Annex 2.

EQUIPPING

The second action in rinderpest preparedness is to equip the emergency management plan for rinderpest. Managers responsible for the plan must assess and resource personnel, and the specialized equipment and supplies required to properly execute their plans. Broad considerations must include the equipment and supplies to conduct the following activities:

- surveillance and collection of samples in the field from both live animal and post-mortem examination;

- handling of samples in the central veterinary laboratory and supplies necessary to ship to an FAO or OIE rinderpest reference centre/laboratory;
- wearing of personal protective equipment for laboratory and field work;
- transportation, including fuel;
- remote communication through mobile and computer devices;
- emergency rinderpest vaccination (vaccine, needles, syringes, cold chain support);
- animal health emergency operations centre functions.

The equipment and supplies needed to implement emergency management plans for rinderpest should be carefully assessed and the gaps noted. Annex 1 includes checklists to assist in resource evaluation.

TRAINING

Training is the third action in rinderpest preparedness, and follows planning and equipping. After the emergency management plan for rinderpest has been written and properly resourced with personnel, equipment and supplies, all stakeholders with actions assigned in the plan should receive adequate training on the functions they will be expected to perform. Training is needed on a regular basis in order to maintain specialized awareness and skills necessary to execute the plan.

Note: It is important to identify who within the competent national authority is designated with the responsibility for developing, delivering and funding the training.

If rinderpest plans are similar within regions, it would be of value to collaborate on training approaches. Information on rinderpest and emergency management plans can be included in training courses with a focus on other TADs.

NATIONAL ACTIONS FOR TRAINING

Awareness raising

A priority action for countries is to raise awareness of rinderpest among all stakeholders, from the highest

level of government to community level throughout the country. Given the increasing likelihood that most livestock owners and veterinarians have never witnessed a clinical case of rinderpest, special consideration must be given to raising awareness and maintaining vigilance. Awareness raising takes the form of development and distribution of educational tools as a resource for advocacy among a variety of stakeholders, including:

- farmers, pastoralists, livestock owners;
- veterinarians, paraprofessionals and community animal health workers;
- educators and veterinary students;
- laboratory personnel;
- government officials (including the top-ranking officials with authority for emergency declaration and funding) to encourage political commitment.

The aim is to raise awareness and understanding about rinderpest. Stakeholders should understand their responsibilities within the national emergency management plan for rinderpest as well as any regional strategies and the GRAP. They should also be aware that the rapid reporting of suspect cases is an important step for early detection. Awareness raising should be undertaken even where an emergency management plan for rinderpest may not yet be fully developed.

FAO and the OIE have a series of awareness-raising and educational materials available for consultation and for implementation at the national level and within veterinary curricula. National authorities are strongly encouraged to take ownership of these materials, disseminate them, and translate them into local languages where appropriate. The materials are available online (FAO, 2017; OIE, 2018c).

Technical training

The national authority responsible for the rinderpest emergency management plan should identify and maintain a core workforce of highly trained staff sufficient to carry out the technical competencies required to execute the plan. A lack of training has historically caused inefficient and ineffective emergency responses. Although the competencies may vary from country to country



depending on the plan, processes and procedures, the following are examples of training that may be required for various positions:

- specific roles and responsibilities of the trainees in the national, regional/continental and international (GRAP) emergency management strategies and plans for rinderpest;
- preparedness – FAO GEMP Essentials workshop, how to conduct a risk assessment, and training teams on the incident management system;
- prevention – SOPs for laboratory biosecurity, safe destruction and sequestration of RCVM, farm biosecurity, etc.;
- detection – SOPs for syndromic surveillance information, reporting mechanisms, diagnostic sample collection and submission to the central veterinary laboratory (certification of laboratory personnel in the International Air Transport Association standards for dangerous goods), etc.;
- response – SOPs for risk communication, targeted surveillance, conducting a rapid risk assessment, field investigation and sample collection, stamping out and culling, emergency vaccination, etc.;
- mobilizing resources – SOPs for transfer of diagnostic materials to the central veterinary laboratory and testing, deployment of vaccine for emergency use, emergency funding, etc.;
- recovery – SOPs for evaluation of the response through after-actions and improvement planning, surveillance to prove freedom, restoration of trade, etc.

REGIONAL/CONTINENTAL ACTIONS FOR TRAINING

Regional/continental organizations are uniquely positioned to leverage support for rinderpest-related training at the national, subregional and regional levels. Some examples include:

- maintaining awareness of rinderpest through advocacy with ministers in charge of agriculture, national chief veterinary officers, veterinary education systems;
- including rinderpest training in regional training activities related to other TADs;

- sponsoring rinderpest capacity building at grassroots levels;
- promoting annual “rinderpest freedom” celebration activities and technical training;
- coordinating collaborative approaches to training across the region;
- advocating for funding to conduct training at a multinational level.

INTERNATIONAL ACTIONS FOR TRAINING

The Rinderpest Secretariat can provide significant technical guidance for capacity development to strengthen rinderpest surveillance, risk assessment, risk management, and veterinary laboratories. The following are examples of resources available to train stakeholders in rinderpest, along with other material developed during awareness campaigns by FAO and the OIE:

- FAO–OIE GRAP;
- *A Practical Guide for Rinderpest Campaign Field Personnel* (FAO, 1985);
- *Communication Handbook: Veterinary Services* (OIE, 2015);
- e-learning modules on disease recognition, vaccination and reporting;
- webinars and regional/international workshops.

EXERCISING

The fourth action in the rinderpest preparedness cycle is to conduct simulation exercises to validate the rinderpest emergency management plan, and to assess whether equipment and training provisions are operational.

Well-designed exercises provide a low-risk environment to test capabilities, familiarize personnel with roles and responsibilities, and foster meaningful interaction and communication. Simulation exercises are cost-effective tools, enabling stakeholders to: test the rinderpest plans and SOPs; evaluate the equipment and supplies necessary to implement the rinderpest plan; and increase the proficiency of the knowledge, skills and abilities acquired.

The complexity of each exercise should be commensurate with the capabilities of the participants, with exercises becoming increasingly challenging over time. The first series of exercises should be discussion-based, which are simpler in format. These include, for example, seminars, workshops and tabletop exercises. Discussion-based exercises typically focus on strategy and policy-oriented issues, and are valuable for familiarizing players with, or developing new plans, policies, agreements and procedures. Once capabilities have been developed through simulated discussions, operations-based exercises can be considered. Operations-based exercises are more complex than discussion-based ones and are characterized by actual reaction to a real-time scenario, such as initiating communications or mobilizing personnel and resources to the field. Examples of operations-based exercises include drills, functional exercises, and full-scale exercises involving deployed assets from multiple sectors. There is a direct relationship between capabilities and exercise complexity, and exercise planners should carefully assess the exercise design and planning.

It is important to conduct an evaluation of each exercise and publish an after-action report that identifies strengths, areas for improvement, and recommended follow-up actions with a timeline for completion.

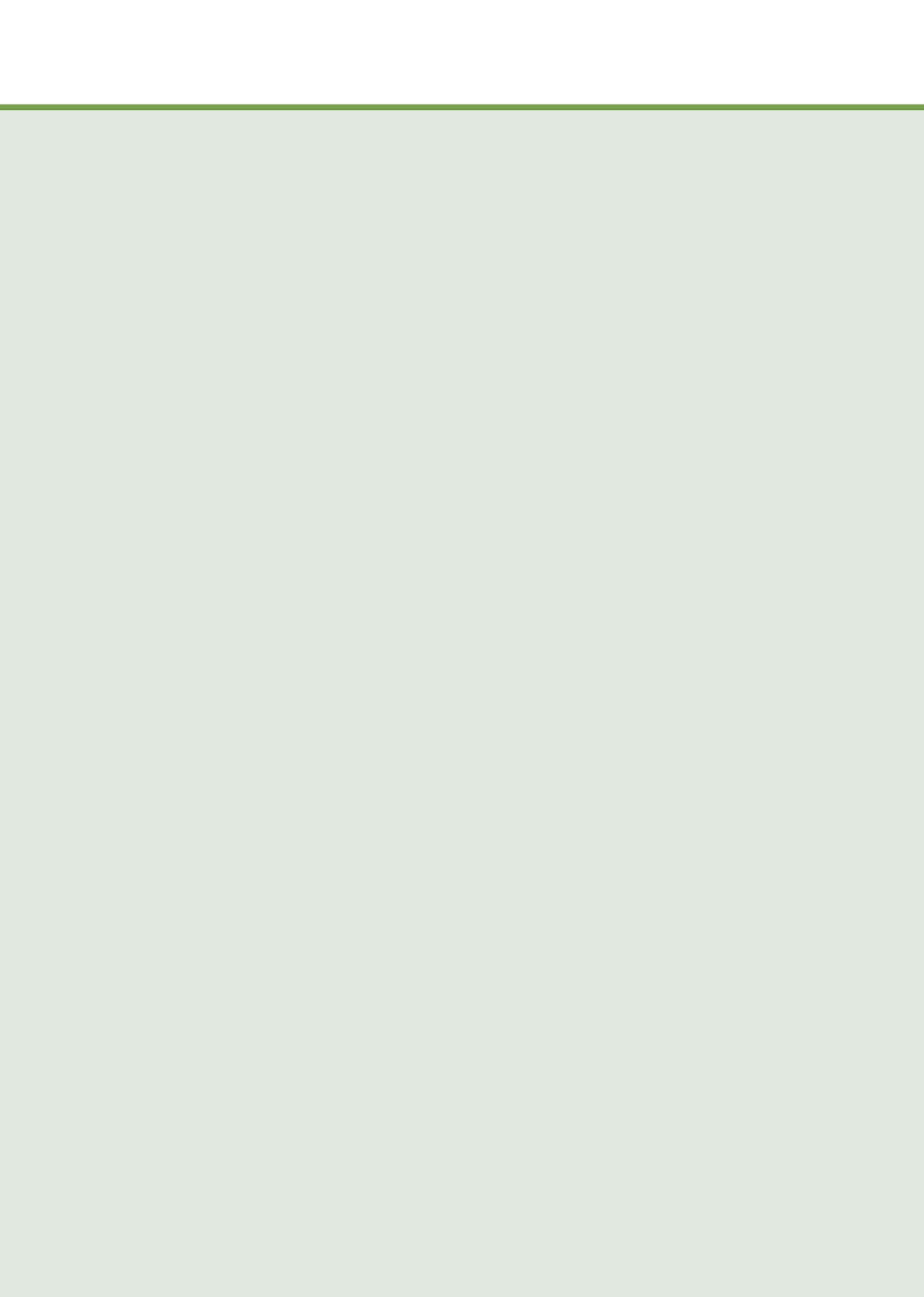
NATIONAL, REGIONAL/CONTINENTAL AND INTERNATIONAL ACTIONS FOR EXERCISING

Exercises for rinderpest should be strategically planned, conducted and evaluated at the national, regional/continental and international levels, possibly in conjunction with exercises for other TADs. Many resources are available to help design, conduct and evaluate exercises. To date, the Rinderpest Secretariat has conducted regional rinderpest tabletop exercises in Africa and Asia, and may provide the situation manual and after-action reports upon request.

The preparedness checklists in Annex 1 provides training recommendations at the national, regional/continental and international levels.

PREVENT







The primary activities necessary to prevent or reduce the negative impact and losses from a potential rinderpest re-emergence include reducing the risks associated with holding RVCM, and managing other risks identified through the risk analysis process conducted during the preparedness stage.

NATIONAL ACTIONS FOR PREVENTION

The most effective national prevention measure for rinderpest re-emergence is to eliminate all remaining RVCM holdings. Countries are encouraged to investigate and report all RVCM holdings in-country to the OIE through the annual survey. If RVCM is maintained in an institute other than an RHF, countries are encouraged to take the following actions:

1. Destroy stocks following the FAO–OIE SOP (FAO and OIE, 2016a).

or

2. Transfer a minimum number of valuable samples to an RHF following the FAO–OIE SOP (FAO and OIE, 2016b).

A third option, as a last resort, is to apply to host an RHF (FAO, 2018). FAO offers assistance to countries for all of the options.

In addition to reducing RVCM stocks, countries should mitigate additional risks identified in the national rinderpest risk analysis. They should do so through interventions such as implementation of sufficient trade policies, border inspections, farm biosecurity measures and livestock movement controls to prevent the entry of rinderpest virus in the event of rinderpest re-emergence in other countries.

REGIONAL ACTIONS FOR PREVENTION

Regional organizations can aid in prevention by encouraging all countries in the region to investigate and report RVCM holdings. Regional organizations should promote and assist in RVCM destruction and/or transfer to an RHF, and formulate resolutions to encourage compliance. Regional organizations should engage in risk communication to national governments about the potential risk to the region of maintaining RVCM stocks and the costs associated with an outbreak.

INTERNATIONAL ACTIONS FOR PREVENTION

One of the primary roles of the Rinderpest Secretariat is to prevent the re-emergence of rinderpest. This is accomplished by its responsibility to maintain oversight of RHF and reduce the number of RVCM stocks.

The joint actions of FAO and the OIE are as follows:

- designation and oversight of RHF;
- monitoring rinderpest virus stocks in RHF on a regular basis and empowering the RHF network;
- support for sequestration and destruction of the remaining rinderpest virus stocks;
- approval of requests for research using RVCM;
- ensuring access to rinderpest vaccines.

REDUCING THE RISK RELATED TO THE REMAINING STOCKS OF RINDERPEST VIRUS

A number of institutes around the world continue to hold RVCM, as defined in the OIE Terrestrial Code, including vaccines. FAO and the OIE are charged by their respective

Members with the responsibility for preventing the re-emergence of rinderpest in animal populations.

To minimize the risk of rinderpest virus release, both FAO Resolution 4/2011 (FAO, 2011b) and OIE Resolution 18/2011 (OIE, 2011) urge all FAO and OIE Members to either destroy their RVCV or transfer these materials to an RHF. Moreover, FAO and the OIE prohibit any manipulation of RVCV to be conducted outside of RHFs. FAO and the OIE advocate for compliance with the international and regional resolutions in destruction and sequestration of RVCV, coordinating the process of sequestration and destruction of RVCV, and designating FAO–OIE RHFs.

FAO and the OIE work together to identify countries storing RVCV. FAO in collaboration with the OIE and regional organizations, invite them, as well as their neighbours, for advocacy meetings. The purpose is to increase awareness and seek compliance with virus destruction and sequestration. The biological risk management requirements, mandate for RHFs, and the economic impact from the event of rinderpest re-emergence are presented to the relevant stakeholders.

DESTRUCTION AND SEQUESTRATION

The option that best supports the maintenance of global freedom from rinderpest is destruction of RVCV. FAO and the OIE offer options to countries to safely destroy and/or sequester their RVCV holdings. Countries may request an FAO expert team mission to assist with virus destruction and sequestration, facility decontamination, shipment of RVCV to RHFs, and training of laboratory personnel on

biosafety and biosecurity. Countries may also carry out these activities on their own – with FAO remote technical support – using the established SOPs.

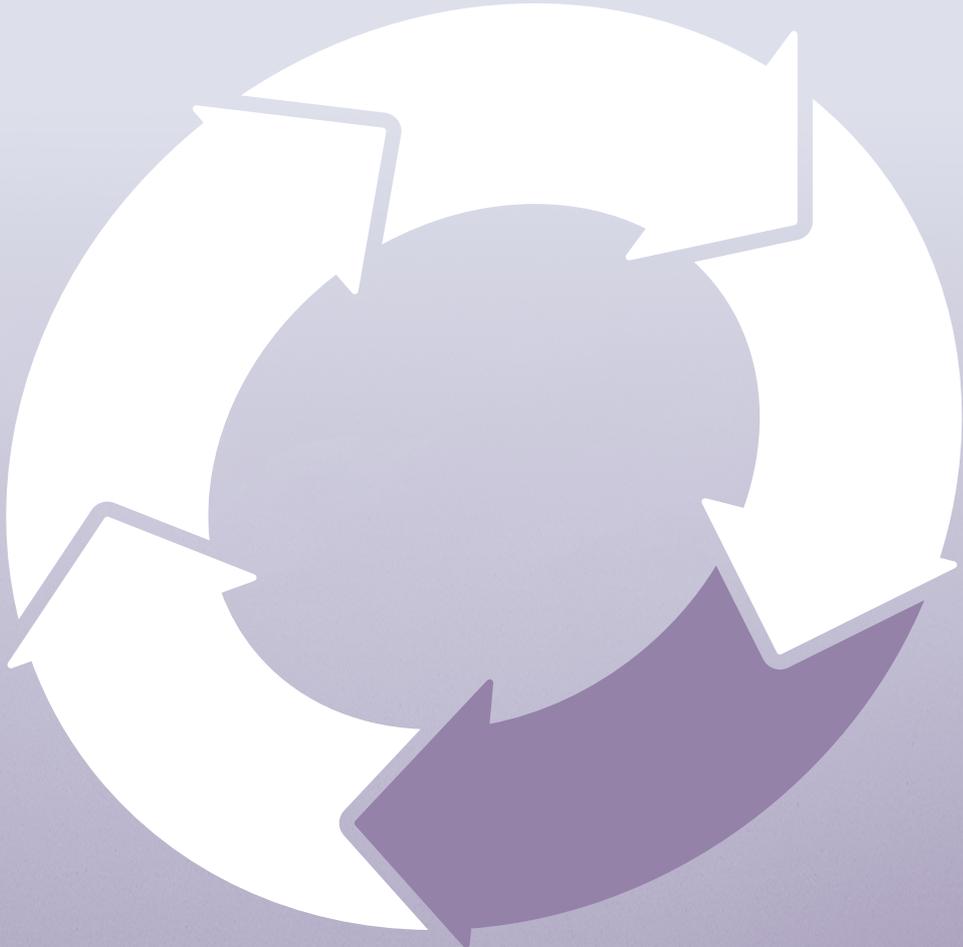
RINDERPEST HOLDING FACILITIES

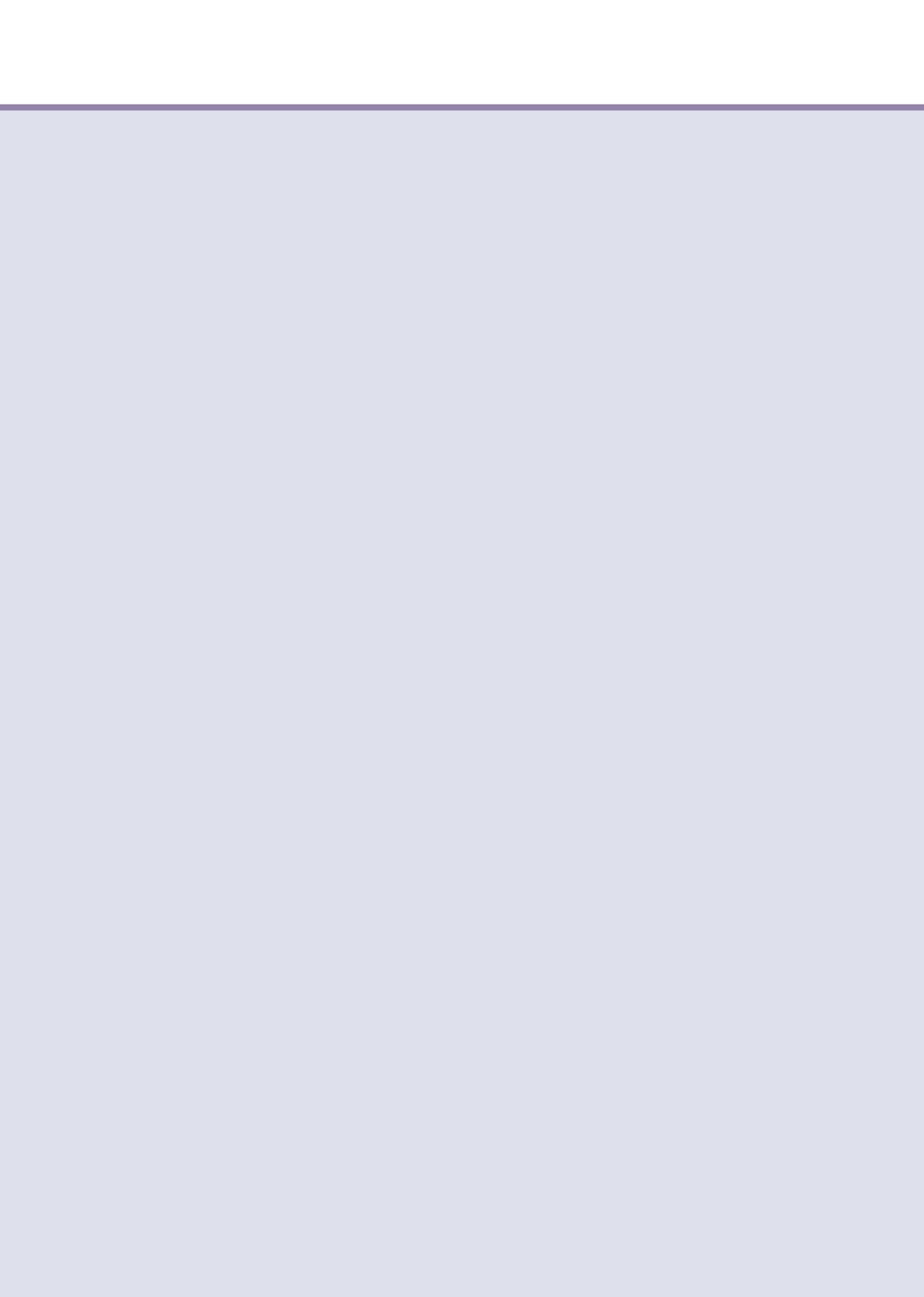
Where destruction or sequestration is not an option, a country may apply to the Rinderpest Secretariat to host an RHF. The approval process for designation as an RHF is conducted jointly by FAO and the OIE. The country must have an up-to-date rinderpest national contingency plan (NCP). The application process consists of the submission of a dossier to, and its revision by, the Rinderpest Secretariat under the advice of the JAC. If satisfactory, a team of independent experts conducts a site inspection to ensure compliance with the international biosafety and biosecurity standards identified in OIE Resolution 23/2014 (OIE, 2014).

FAO and the OIE designate RHFs in accordance with the following categories:

- Category A: RHFs for storing RVCV, excluding vaccine stocks and their seeds.
- Category B: RHFs for storing only manufactured vaccines, vaccine stocks and material solely for vaccine production. Category B RHFs are bound to cooperate with FAO and the OIE by deploying vaccine in emergency situations; the process for designation and their mandate are further described in Annex 2. Additional information on these options including an up-to-date list of RHFs can be found on the Rinderpest Secretariat website (FAO, 2018).

DETECT







Detection includes actions taken to identify rinderpest virus in animals. Early detection of rinderpest re-emergence is essential for a successful response to stop further spread that could lead to devastating consequences on a global scale. Sensitive disease surveillance systems at the national level – capable of detecting a clinical case of rinderpest as early as possible – are of primary importance for global preparedness in the rinderpest post-eradication era. In most possible scenarios, the first indication of a suspected case of rinderpest will occur during routine animal disease surveillance at the farm/village level. Therefore, national surveillance is worthy of special emphasis in rinderpest plans at all levels.

Sensitive surveillance systems will trigger false alarms. Therefore, it is important to manage them appropriately in order to avoid a negative impact on the effectiveness of the surveillance system. Farmers, traders, animal

health authorities, private veterinarians, veterinary paraprofessionals, and veterinary educators should be informed about the added value associated with reporting all suspected cases.

The local and national veterinary authorities should promptly and thoroughly investigate all rumours or possible leads on rinderpest suspected cases. Support may be requested from regional/continental and international organizations. Rumours alone should not be used to restrict trade in animals or animal products.

DEFINITIONS OF SUSPECTED AND CONFIRMED CASES OF RINDERPEST

The OIE Terrestrial Code chapter on infection with rinderpest virus highlights the need to maintain passive surveillance and includes definitions for suspected and confirmed cases of rinderpest (Table 1).

Table 1. Definitions of rinderpest suspect and confirmed cases (OIE Terrestrial Code, Chapter 8.16)

DEFINITION OF RINDERPEST SUSPECTED CASE	DEFINITION OF RINDERPEST CONFIRMED CASE
<p>Rinderpest should be suspected if one or more animals is exhibiting clinical signs consistent with “stomatitis-enteritis syndrome”.</p> <p>Stomatitis-enteritis syndrome is defined as fever with ocular and nasal discharges in combination with:</p> <ol style="list-style-type: none"> clinical signs of erosions in the oral cavity with diarrhoea, dysentery, dehydration or death; or necropsy findings of haemorrhages on serosal surfaces, haemorrhages and erosions on alimentary mucosal surfaces and lymphadenopathy. <p>The detection of rinderpest-virus-specific antibodies in an animal of a susceptible species with or without clinical signs is considered a suspected case of rinderpest.</p> <p>Stomatitis-enteritis syndrome could indicate a number of diseases, from which rinderpest should be differentiated by appropriate laboratory investigation.</p>	<p>Rinderpest should be considered as confirmed when, based on a report from an appointed FAO/OIE rinderpest reference centre/laboratory:</p> <ol style="list-style-type: none"> rinderpest virus has been isolated from an animal or a product derived from that animal and identified; or viral antigen or viral ribonucleic acid specific to rinderpest virus has been identified in samples from one or more animals; or antibodies to rinderpest virus have been identified in one or more animals with either epidemiological links to a confirmed or suspected outbreak of rinderpest, or showing clinical signs consistent with recent infection with rinderpest virus.

Source: OIE (2017).

NATIONAL ACTIONS FOR DETECTION

Following detection of a suspected case of rinderpest, the subnational veterinary authorities should immediately notify the national veterinary authority. All authorities should take action in collaboration with local leaders to help confirm or rule out the case. The rinderpest NCP should provide instructions for handling suspected cases. National authorities should ensure the following:

- Rinderpest remains a notifiable disease.
- A surveillance system (including epidemiological investigations of suspected cases) is maintained to detect possible disease events.
- Suspected cases, including undiagnosed die-offs, shall be rapidly investigated, sampled immediately and submitted to an FAO/OIE rinderpest reference centre/laboratory.
- Premises are quarantined and/or movement restricted of suspected animals pending laboratory results.
- A field investigation may be necessary:
 - in the first stage, samples are collected and submitted to the national laboratory, followed by a full epidemiological investigation, if there is evidence for reasonable suspicion;
 - two sets of split samples shall be collected in accordance with the chapter on infection with rinderpest virus of the OIE Manual – one set to ship to the FAO/OIE rinderpest reference centre/laboratory for complete analysis, and one to be kept at the central veterinary laboratory for further differential diagnosis as warranted.
- If needed, expertise from the regional/continental or international organizations may be requested to provide resources to help confirm or reject whether the case meets the OIE Terrestrial Code definition (Table 1).
- OIE Members are obliged to notify the OIE of important epidemiological events, such as a suspected cases of rinderpest, through an immediate notification using the World Animal Health Information System (WAHIS).
- Risk communication SOPs should be followed to provide accurate information to the public and media to prevent/mitigate false rumours.

REGIONAL/CONTINENTAL ACTIONS FOR DETECTION

Regional/continental organizations may provide technical guidance and support for national surveillance programmes to improve capacity for early detection.

FAO AND OIE RINDERPEST REFERENCE CENTRE/LABORATORY ACTIONS FOR DETECTION

The FAO and OIE rinderpest reference centres/laboratories maintain procedures to facilitate sample submission from countries in the event of a rinderpest suspected case. The receiving laboratory will advise the submitting laboratory on shipping details and may request epidemiologic information related to the case. Upon receipt of samples, the laboratory processes them within a timeframe in accordance with its SOPs.

If samples are negative for rinderpest virus, the FAO and OIE rinderpest reference centres/laboratories are encouraged, but not obligated, to conduct additional differential diagnostic testing to determine other possible causes of disease.

If samples are positive for rinderpest virus, the FAO and OIE rinderpest reference centres/laboratories must maintain a mechanism for promptly reporting positive test results to FAO, the OIE, the chief veterinary officer of the submitting country and the submitting veterinary laboratory in order to expedite the country's emergency response in accordance with its rinderpest NCP.

OTHER INTERNATIONAL ACTIONS FOR DETECTION

The Global Early Warning and Response System for major animal diseases, including zoonoses (GLEWS) serves as the official tripartite platform between FAO, the OIE and the World Health Organization for monitoring animal health events. FAO and the OIE will communicate with national authorities and regional organizations about all rumours and suspected cases. Respective FAO and OIE regional, subregional and country representatives enquire about any rinderpest rumours and syndromic events with



the country's national veterinary services, while sharing such information with their respective headquarters and the Rinderpest Secretariat.

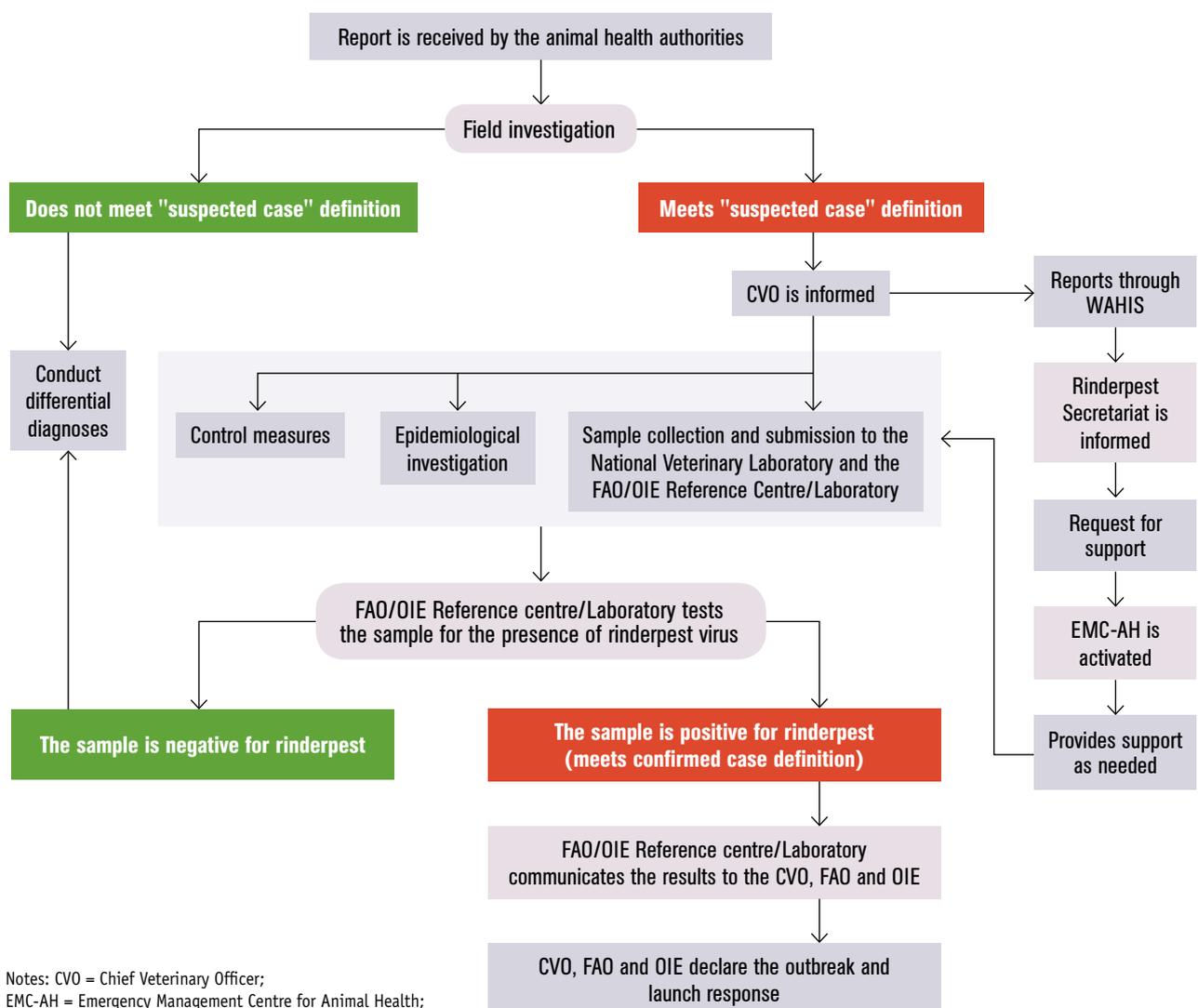
FAO and the OIE may conduct the following actions:

- Assist with logistics and finance to enable emergency shipments of supplies, transport, and aid with customs clearance.
- Facilitate collaboration between the submitting country officials and FAO and OIE rinderpest reference centres/laboratories.

- Coordinate national, regional/continental and other partners in the formulation and dissemination of any messages to the public and media.
- The OIE to remind Members to notify the OIE of suspected cases of rinderpest, and to ensure that the most accurate scientific information and disease event reports are communicated to Members.

Figure 3 summarizes the actions that should take place for rinderpest detection.

Figure 3. Key actions for rinderpest detection



RESPOND







Due to the status of global disease freedom, a report of a suspected case of rinderpest would call for urgent action. The initial report of a suspected case could come from within the country or from outside the country, including the media, FAO or the OIE. Due to the timeframe from sample collection to receipt of reports from FAO and OIE rinderpest reference centres/laboratories, swift actions are required to ensure rapid containment and elimination of the disease. Moreover, FAO's Early Warning Early Action (EWEA) system translates warnings into anticipatory actions to reduce the impact of specific disaster events. It focuses on consolidating available forecasting information and putting plans in place to make sure partners act when a warning is at hand.

EARLY ACTIONS IN THE EVENT OF A SUSPECTED CASE

NATIONAL EARLY ACTIONS

National veterinary services should consider the following early actions:

- Activate the rinderpest NCP
- Implement the appropriate procedures in the rinderpest NCP and SOPs for a suspected case of rinderpest:
 - quarantine and stop movement of all susceptible livestock on the affected premises;
 - immediate and thorough field investigations of all premises with links to the suspected case to determine the health status of the populations;
 - swift resource availability gap analysis and seek assistance from FAO, the OIE, and other organizations or development partners for immediate support;

- maintain regular communication with regional/continental organizations, FAO and the OIE.

REGIONAL/CONTINENTAL EARLY ACTIONS

Upon notification of a suspected case by national authorities and/or the EWEA system, the regional/continental organizations should consider the following early actions:

- Implement the rinderpest regional strategy/plan and determine a series of actions to be taken by the organization, particularly the appropriate SOPs.
- Reach out to the affected country and provide direct support in managing the situation – including coordinated communication at the regional level.
- Engage in incident coordination at the international level.

FAO EARLY ACTIONS

Following notification of a suspected case by national authorities and/or the EWEA system, FAO will consider the following early actions:

- Activate the animal health emergency operations centre (AH-EOC) of the Emergency Management Centre for Animal Health (EMC-AH) to manage event coordination and communication among stakeholders, including authorities in the affected country and regional/continental organizations, and the OIE.
- Offer support to assist the country to quickly confirm, conduct epidemiological field investigations, and implement control measures.
- Remain vigilant for information on other suspected cases of rinderpest in different locations.

OIE EARLY ACTIONS

Following notification of a suspected case by national authorities, the OIE will consider the following early actions:

- Ensure the most accurate scientific information and disease event reports are communicated to Members.
- Actively engage in event coordination.

RINDERPEST SECRETARIAT EARLY ACTIONS

Following notification of a suspected case by national authorities, the Rinderpest Secretariat will consider the following early actions:

- Continue follow-up of suspected cases and monitoring for additional cases for early warning and early action.
- Request the assistance of the FAO EMC-AH for event coordination.
- Provide technical expertise to the EMC-AH for the international event coordination.
- Consult with its JAC as necessary.

FAO AND OIE RINDERPEST REFERENCE CENTRES/ LABORATORIES EARLY ACTIONS

Following notification of a suspected case by national authorities, the FAO and OIE rinderpest reference centres/laboratories will consider the following early actions:

- Implement the appropriate procedures as outlined in their SOPs for suspected cases.
- Disseminate protocols for submission of samples for diagnostic testing.
- Provide support for testing of additional samples.

ACTION FOR A CONFIRMED CASE OF RINDERPEST

The confirmation of a rinderpest case by FAO and OIE rinderpest reference centres/laboratories will trigger a cascade of emergency responses from officials at the national, regional/continental and international levels. It is imperative that the global community work together

to immediately implement response actions with the following overarching goals:

- Rapidly identify additional rinderpest cases.
- Halt the spread of rinderpest.
- Eliminate rinderpest as quickly as possible.

NATIONAL ACTIONS FOR A CONFIRMED CASE

Following the first confirmed case of rinderpest, a coordinated response should be initiated at the national level. Emergency action will require the national veterinary services to conduct many actions simultaneously in accordance with its rinderpest NCP.

Suggested actions include:

- Notify the OIE.
- Issue orders to quarantine and stop movement of affected and exposed animals.
- Quickly stamp out infected animals, where applicable, and implement good biosecurity practices on the affected premises.
- Deploy trained rapid response teams to implement control measures.
- Trace and quarantine any potentially exposed animals.
- Launch additional epidemiological field investigations, and implement targeted surveillance.
- Initiate the procedure to request vaccine and appropriate diagnostics.
- Notify national stakeholders of the confirmed case, and plan appropriate risk communication messages.
- Convene the competent government authorities that will analyse the epidemiological situation and make decisions on appropriate response actions.
- Convene the mechanism for incident coordination and information sharing with country, regional/continental and international stakeholders.
- Access national emergency funding.
- Initiate communication with regional/continental organizations, FAO and the OIE.
- Prepare and submit requests for assistance to regional/continental organizations, FAO and the OIE, and possible donors.



Conduct a rapid risk assessment

In addition to immediate initiation of response actions for a rinderpest outbreak in accordance with the rinderpest NCP, the affected country and neighbouring at-risk countries should consider performing a rapid risk assessment (RRA) to evaluate the extent and impact of the outbreak and to identify appropriate risk mitigation procedures.

Surveillance during emergency response

In accordance with the OIE recommendations and scientific requirements, enhanced national surveillance is needed as part of the response to the outbreak. The aim of the surveillance system after the occurrence of a rinderpest case is to assess the extent of disease spread and the progress of eradication efforts. Surveillance activities during the response stage provide the necessary information to help contain the infection as much as possible within limited geographical areas.

High-risk areas (such as those with high animal density and animal movement) will be targeted for surveillance to identify suspected cases. Regular and frequent reports are expected with the intent to modify the plan of action accordingly. An existing surveillance plan for emergency response to other TAD outbreaks may potentially be utilized to rapidly build this surveillance system.

Diagnostics during emergency response

Central veterinary laboratories in the affected country should continue to coordinate with FAO and OIE rinderpest reference centres/laboratories and the Rinderpest Secretariat to submit additional samples during the period of enhanced surveillance.

If the national veterinary services determine the need to diagnose additional cases of rinderpest at its central veterinary laboratory, officials can submit a request to the Rinderpest Secretariat for transfer of diagnostic technology, and for support of a laboratory personnel surge. Countries without central diagnostic laboratories should leverage such available facilities in neighbouring countries.

Rinderpest emergency vaccination

A component of national actions for a confirmed case includes consideration of rinderpest emergency vaccination and/or stamping out of infected animals. The OIE Terrestrial Code (OIE, 2017) contains information on rinderpest emergency vaccination.

The national authority in the affected country must submit the “Official Request for Vaccine” to the Rinderpest Secretariat in accordance with the Operational Framework for the Management and Deployment of the Rinderpest Vaccine Reserve (Annex 2). The request will be assessed by FAO and the OIE. If the request is accepted, the Rinderpest Secretariat will liaise with the RHF to facilitate vaccine deployment and shipping procedures. Emergency vaccination is acceptable only with live-attenuated tissue culture rinderpest vaccine produced in accordance with the OIE Manual (OIE, 2018b).

Risk communication

The national veterinary services should lead risk communication to exchange information, advice and opinions in real time between animal health experts, government officials, and those who are at risk during a rinderpest outbreak in order to gain understanding from the community affected and to make informed decisions. During an outbreak, risk-based communication is critically important to reach agreements on control actions and to achieve rapid eradication. An effective risk communication process is needed to bridge the gap between how the animal health experts define risk and how the public perceives it. Moreover, risk communication is necessary as information demand by the public is at a peak during an outbreak.

REGIONAL/CONTINENTAL ACTIONS FOR A CONFIRMED CASE

Each responsible regional/continental organization should implement its response plan for rinderpest with details of its actions for a confirmed case. The organizations should initiate incident coordination and information sharing with all countries in the region and with international organizations. Regions are encouraged to provide support

for affected and at-risk countries through implementation of their regional rinderpest strategies/plans and provision of technical and financial support.

Suggested actions include:

- Deploy experts to assist the country with surveillance, diagnostics, vaccination, and stamping out.
- Assist neighbouring at-risk countries to conduct surveillance.
- Assist with enforcement of animal movement control across borders and trade restrictions.
- Support rapid deployment of vaccine in the region, as warranted.
- Assist in cross-border collaboration in disease surveillance, intelligence, reporting, vaccination programme implementation, and animal movement.

INTERNATIONAL ACTIONS FOR A CONFIRMED CASE

Following confirmation of a case of rinderpest, the FAO and OIE Directors-General will publicly announce the suspension of global freedom to all Members and other relevant stakeholders. A coordinated response should be initiated at the international level.

FAO response

FAO maintains animal disease emergency response mechanisms to support the affected country and region during a rinderpest outbreak:

- The Emergency Centre for Transboundary Animal Diseases, as available, along with FAO decentralized offices as appropriate, will deliver veterinary assistance at the country level to FAO Members responding to a threat or outbreak.
- The EMC-AH will perform the following:
 - Activate its AH-EOC, if not already activated, and initiate activities for global incident coordination, such as supporting the Rinderpest Secretariat as technical lead, supporting the FAO and OIE leadership as the multiagency coordination group, collecting and analysing outbreak information, issuing regular situation reports to all stakeholders, supporting supply chain management (e.g. personal

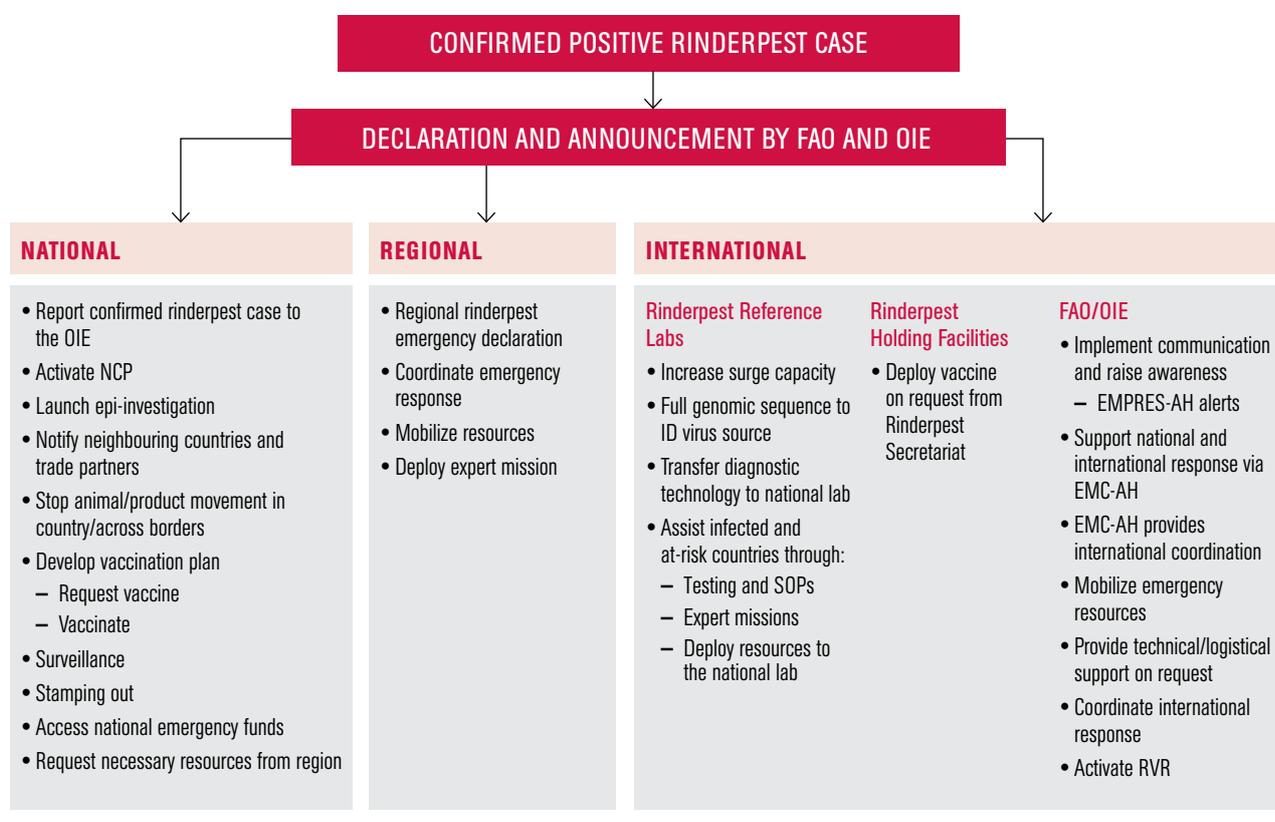
protective equipment, laboratory supplies, diagnostic sample boxes, and transport to FAO and OIE rinderpest reference centres/laboratories), and other incident coordination activities.

- Reach out to country officials and offer support with rapid deployment of experts to support the following:
 - emergency response assessments;
 - prolonged outbreak incident management system support;
 - set-up of diagnostics in the central veterinary laboratory.
- The Emergency Prevention System for Animal Health (EMPRES-AH) will issue alerts and early warnings, and provide technical expertise for surveillance and laboratory support.
- The Emergency and Rehabilitation Division will remain available to respond to country requests for emergency response and rehabilitation funding.
- The FAO/International Atomic Energy Agency (IAEA) joint division can support laboratory capacity for diagnostics and deployment of diagnostic kits to affected countries.
- If the outbreak became widespread in a number of countries and over a prolonged period, FAO would prepare for protracted and sustained support to ensure food security and livelihoods.

Should an FAO Member request emergency assistance in response to a significant animal-health-related outbreak (e.g. rinderpest) that is beyond the capacity of FAO decentralized offices and the EMC-AH, hence requiring full corporate support, FAO can declare a Level 3 (L3) emergency response. An L3 emergency response implies a full-scale corporate effort and the application with immediate effect of FAO L3 emergency response protocols aimed at ensuring the streamlining and rapid execution of key processes and actions in response to the crisis. In the event of L3 activation for infectious hazards, including zoonotic diseases, the EMC-AH will also provide support to the coordination and management of FAO emergency response activities.



Figure 4. Response to a confirmed positive rinderpest case



OIE response

In accordance with the chapter on infection with rinderpest virus of the OIE Terrestrial Code (OIE, 2017) and the OIE Manual (OIE, 2018b), the OIE will proceed as follows:

- Initiate the international contingency plan¹ and provide recommendations on emergency vaccination.
- For purposes of trade with affected countries, reinstate the provisions of the 2010 version of the OIE Terrestrial Code.
- Provide adequate guidance through the OIE Terrestrial Code chapters on the killing of animals for disease

control purposes and on the disposal of dead animals for when stamping out is the chosen method to put in place during response and mitigation strategies (OIE, 2017).

- Facilitate disease reporting through WAHIS. Any notification to be immediately communicated to all OIE Members, OIE Delegates, and to all subscribers to the OIE-Info Distribution List. The information to be published at the WAHIS Interface and through the smartphone application “WAHIS Alerts”.
- Offer guidance on the OIE standards pertaining to rinderpest, as well as relevant chapters on disease surveillance and on zoning and compartmentalization, in a response scenario.

1 The international contingency plan mentioned in the OIE Terrestrial Code refers to the Global Rinderpest Action Plan (GRAP).

Rinderpest Secretariat response

The Rinderpest Secretariat will proceed as follows:

- Request the assistance of the EMC-AH to provide global incident coordination and provide support for Rinderpest Secretariat actions.
- Consult with its JAC as necessary.
- Issue rinderpest response strategy guidance, including decision tree tools.
- Coordinate emergency response surveillance plans.
- Provide risk communication guidance.
- Request immediate emergency resource mobilization from donors to support response action, including laboratory support.

FAO and OIE rinderpest reference centres/laboratories

All FAO and OIE rinderpest reference centres/laboratories are to collaborate with FAO and the OIE during emergency response to the fullest extent. Some expected actions are described below:

- Test up to 50 rinderpest samples from every country per year, which will also be considered as surge capacity during emergency response.
- Test additional samples for surge capacity, if necessary.
- Collaborate with the transfer of molecular technology for diagnostics to local and/or regional laboratories.
- Deploy staff to help set up diagnostics in-country if required.
- Collaborate with law enforcement and microbial forensic laboratories in the case of a possible criminal investigation.

INTERPOL actions for a confirmed case

In the event of a suspected intentional introduction of rinderpest, national police can contact INTERPOL through the designated national central bureau (NCB). Through this mechanism, the NCB can link national police with INTERPOL's global network of communication (across its 192 member countries) to assist with aspects of a criminal investigation.

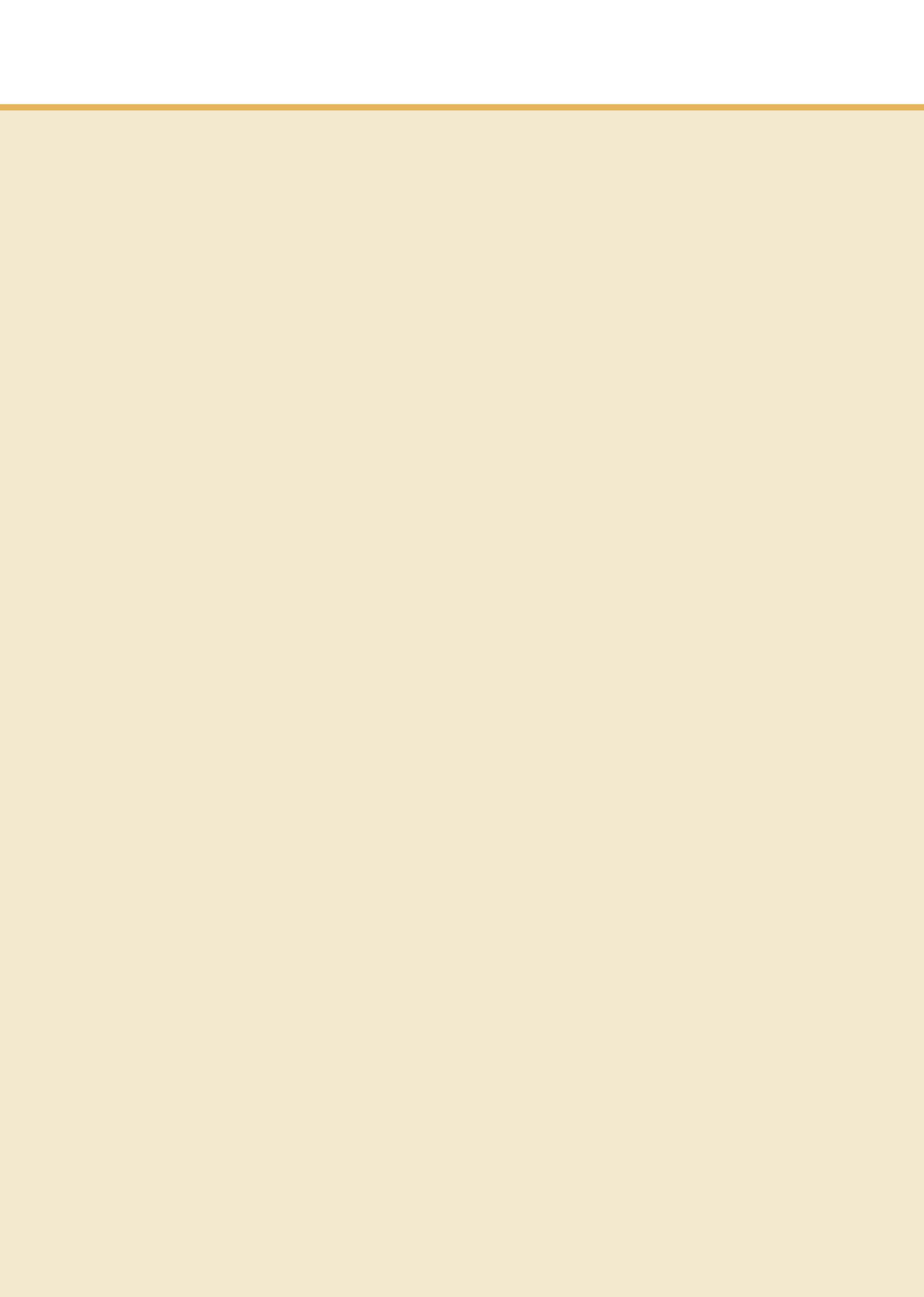
An NCB may proceed as follows:

- Issue an "Orange Notice" to warn of an imminent or ongoing threat to public safety.
- Provide linkages to INTERPOL databases (travel documents, IDs, criminal history, etc.).
- Provide access to subject matter experts, including those specializing in chemical, biological, radiological and nuclear events and forensics.
- Support cross-border investigations, operations and information sharing (through notices and diffusions).

Figure 4 summarizes key actions in response to a confirmed positive rinderpest case.

RECOVER







INTRODUCTION

The Recover stage includes actions to return to the status of global rinderpest freedom. The OIE Terrestrial Code includes specific provisions on recovering free status within a country or zone, recovering global freedom, as well as provisions for surveillance during the recovery stage of rinderpest-free status.

PROOF OF FREEDOM

RECOVERY OF RINDERPEST-FREE STATUS FOR A COUNTRY OR ZONE

A country where a case of rinderpest is confirmed shall be considered by the OIE as infected until shown to be free through targeted surveillance involving clinical, serological and virological testing. The waiting period before requesting OIE recognition of recovery of rinderpest-free status of a country or zone depends on the methods employed to achieve the elimination of infection (see Article 6, from the chapter on infection with rinderpest virus of the OIE Terrestrial Code [OIE, 2017]). Countries will be required to provide a dossier of evidence to the OIE to support their request for recognition of rinderpest-free status.

If it is decided to control the outbreak through stamping out only, the country would have to wait for three months after the slaughter of the last case before submitting

the dossier. Where it is decided to stamp out infected animals and vaccinate target populations, followed by slaughter of the vaccinated animals, the country would have to wait for three months following slaughter of all the vaccinated animals before submitting the dossier.

According to the 2010 edition of the OIE Terrestrial Code (OIE, 2010b), it is possible to regain country and global freedom from rinderpest by vaccinating healthy animals without the obligation to slaughter them afterwards. There are two options under these provisions: (i) diseased animals are culled and healthy animals are vaccinated (and not slaughtered afterwards), and the country must wait six months after cessation of vaccination before submitting the dossier; or (ii) where no stamp-out policy is implemented and the outbreak is controlled through vaccination only, the country must wait 24 months after cessation of vaccination before submitting the dossier.

In all cases, targeted serological surveillance should be done throughout the time span required to control and mitigate the outbreak and regain freedom, as shown in Table 2.

The recovery of rinderpest-free status requires an international expert mission to verify the successful application of containment and eradication measures, and a review of documented evidence by the OIE. The country or zone shall be considered rinderpest free after the submitted evidence has been accepted by the OIE.

Table 2. Measures to control and mitigate a rinderpest outbreak and regain freedom

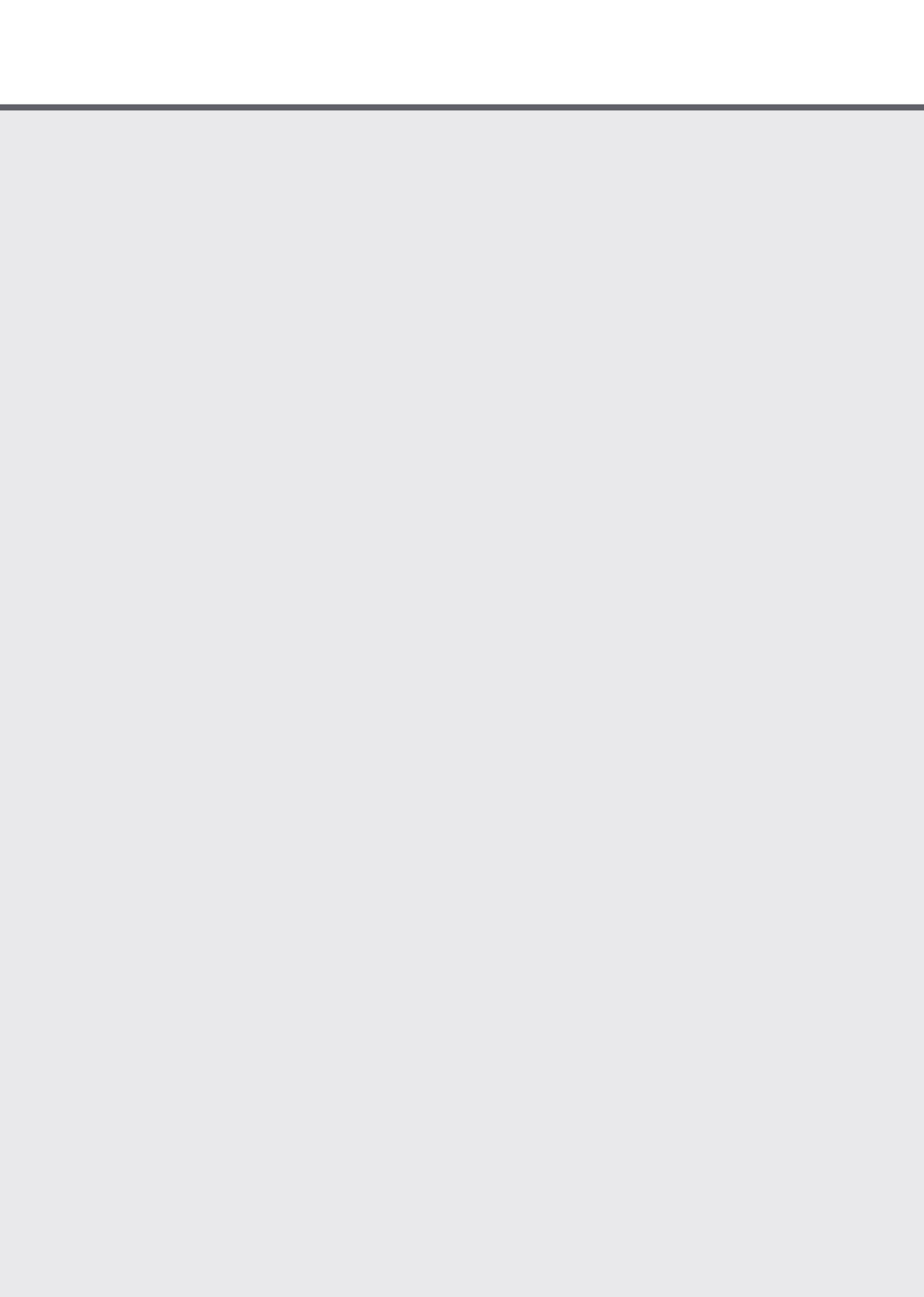
CONTROL MEASURES APPLIED	STAMPING OUT	STAMPING OUT AND EMERGENCY VACCINATION (WITH SLAUGHTER OF VACCINATED ANIMALS)	STAMPING OUT AND EMERGENCY VACCINATION (NOT FOLLOWED BY SLAUGHTER)	VACCINATION (WITHOUT STAMPING OUT)
WAITING TIME BEFORE SUBMISSION OF DOSSIER	3 months after the last case	3 months after the slaughter of all vaccinated animals	6 months after the last case or the last vaccination (according to the event that occurs the latest)	24 months after the cessation of vaccination OR the last case (according to the event that occurs the latest)
SEROLOGICAL SURVEILLANCE	Required	Required	Required	Required
GLOBAL FREEDOM STATUS	Can be regained upon compliance with provisions of the OIE Terrestrial Code		Global freedom is lost, and its recovery would require re-establishment of an internationally coordinated rinderpest eradication programme and assessments of rinderpest-free country status.	

RECOVERY OF GLOBAL FREEDOM

The OIE will reinstate global rinderpest freedom if the conditions for reinstatement are met in accordance with the current provisions of the OIE Terrestrial Code (OIE, 2017). FAO and OIE will jointly declare global rinderpest freedom based upon this reinstatement.

If the conditions to declare global freedom are not met within the timeframe specified by the OIE Terrestrial

Code, the 2010 edition of the OIE Terrestrial Code chapter for infection with rinderpest virus (OIE, 2010b) will be reinstated. Recovery will then require re-establishment of the internationally coordinated rinderpest eradication programme, and reassessments of the rinderpest-free status of countries.



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Glossary

Laboratory biosafety: The principles and practices for the prevention of unintentional exposure to biological materials, or their accidental release. (OIE, 2018, *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*)

Laboratory biosecurity: The controls on biological materials within laboratories, in order to prevent their loss, theft, misuse, unauthorised access, or intentional unauthorised release. (OIE, 2018, *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*)

Rinderpest re-emergence: The occurrence of rinderpest in animals after global eradication.

ANNEXES





ANNEX 1

CHECKLIST FOR PREPAREDNESS

The following checklists can be used by national, regional/continental and international organizations as self-assessment tools to quickly evaluate the status of their rinderpest preparedness.

CHECKLIST FOR NATIONAL PREPAREDNESS

Country name:

Point of contact details:

Name:

Title:

Phone number:

Address:

E-mail address:

Date of completion:

For each item, check only 1 of 4 boxes: Yes, In Progress, Unknown, or Not Applicable (N/A). For those activities where completion is scheduled, please provide the scheduled date of completion under deadline.

Submit your completed checklist to Rinderpest-Secretariat@fao.org in order to have your country's preparedness status evaluated and to seek support for improving preparedness.

DOES YOUR COUNTRY HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	IN PROGRESS	UNKNOWN	N/A	COMMENTS CHALLENGES
1. Authority and frameworks					
Legal authority to require reporting of rinderpest virus containing material (RVCM) stocks					
Legal authority to require destruction and sequestration of RVCM					
Requirement for veterinarians, paraprofessionals, farmers and others to report suspected cases of rinderpest					

DOES YOUR COUNTRY HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	IN PROGRESS	UNKNOWN	N/A	COMMENTS CHALLENGES
Protocol and framework support (such as a reporting hotline/website) for reporting rinderpest suspected cases from the field to the chief veterinary officer					
Local animal health officers stationed throughout the country to respond to suspected cases or an outbreak of rinderpest					
Framework and mechanism for rumour tracking					
National surveillance and laboratory framework to collect and package samples for rinderpest analysis					
National incident management system and framework to respond to rinderpest (to include rapid response teams, incident command, and incident coordination through an animal health emergency operations centre)					
Legal power to issue quarantine / stop movement / biosecurity orders					
Legal power and frameworks to enforce a quarantine / stop movement order. Under Comments, list what agencies will implement enforcement.					
Legal power to require stamping out for rinderpest					
Legal power to require vaccination for rinderpest					
Availability and access of veterinary authorities to national funds to support rinderpest activities, including emergency funds for response actions and compensation					
Legal power and framework to communicate with neighbouring countries, regional/continental and international organizations about rinderpest activities					
Legal power and frameworks to implement border control and trade restrictions for rinderpest prevention					
2. National emergency management plan for rinderpest					
National emergency preparedness plan for rinderpest					
National contingency (response) plan specific to rinderpest? If not, under Comments, indicate what other plan would be used for emergencies.					
Plan includes standard operating procedures (SOPs) to conduct risk analysis to direct preparedness efforts for rinderpest hazard identification, risk assessment, risk mitigation and risk communication					
A national risk analysis for rinderpest has been conducted. If so, under Comments, indicate when the most recent risk analysis was completed.					
Plan includes SOPs for prompt field investigations for suspected cases of rinderpest. If not, are SOPs for other transboundary animal diseases (TADs) available to use? List under Comments.					
Plan includes SOPs for submission of samples to an FAO/OIE rinderpest reference centre/laboratory, to include provisions for biological permits and clearance. If so, under Comments, indicate the facility.					

DOES YOUR COUNTRY HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	IN PROGRESS	UNKNOWN	N/A	COMMENTS CHALLENGES
Plan includes SOPs for rapid response teams for rinderpest. If not, are SOPs for other TADs available to use? List under Comments.					
Plan includes SOPs to conduct rapid risk assessment during response to direct response efforts according to risk					
Plan includes SOPs for developing active surveillance plans during response					
Rinderpest holding facility (RHF) source of rinderpest vaccine identified. If so, list under Comments.					
Plan includes SOPs for rinderpest vaccine stockpile receipt, storage, staging and shipment for field use					
Plan includes rinderpest emergency vaccination strategy and SOPs					
Plan includes SOPs for awareness raising during preparedness stage and risk communication during response stage					
3. Equipment / technical capacity					
Equipment, supplies and vehicles sufficient to support animal restraint and clinical examination					
Equipment, supplies and transport sufficient to support field investigations for rinderpest					
Surveillance equipment and supplies sufficient for live animal and post-mortem sample collection and submission to the central veterinary laboratory					
Packaging and shipping supplies at the central veterinary laboratory sufficient to support transport of diagnostic samples to an FAO/OIE rinderpest reference centre/laboratory according to International Air Transport Association (IATA) standards					
Equipment and supplies, including those for personal protection, cleaning and disinfection, sufficient for rapid response teams					
Equipment and supplies sufficient for rinderpest emergency vaccination					
4. Training					
Mechanism to assess and monitor awareness of rinderpest among stakeholders					
Development and distribution of educational and advocacy tools for stakeholders to maintain awareness about rinderpest and the Global Rinderpest Action Plan (GRAP) in order to encourage reporting of suspect cases. Stakeholders include livestock owners, pastoralists, farmers, national veterinary services, animal health educators, laboratory personnel, and animal health professionals					
Rinderpest awareness, including clinical signs, features in all veterinary curricula in veterinary schools and for veterinary paraprofessionals					
Sponsoring of Good Emergency Management Practice (GEMP) training for rinderpest emergency management					

DOES YOUR COUNTRY HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	IN PROGRESS	UNKNOWN	N/A	COMMENTS CHALLENGES
Training for stakeholders on the national emergency management plan for rinderpest, regional/continental strategies/plans, and the GRAP. If so, under Comments, indicate the frequency of training.					
Official animal health officers and paraprofessionals receive technical training on clinical examination and identification of clinical signs for rinderpest (including in other training sessions on TADs). If so, under Comments, indicate the frequency of training.					
Central veterinary laboratory personnel have technical training on SOPs for sample collection, packaging and shipping to FAO/OIE rinderpest reference centres/laboratories					
Central veterinary laboratory personnel trained in IATA standards					
Rinderpest emergency vaccination teams trained on SOPs for vaccine handling, record-keeping, and administration of vaccine into animals					
5. Exercise					
Multiyear plan to conduct rinderpest exercises, both discussion-based and operations-based, to test plans, equipment and training					
Discussion-based exercise conducted					
Operations-based exercise conducted					
After-action reviews of plans, equipment and training					
Development and implementation of improvement plans to update plans, equipment and training					

CHECKLIST FOR REGIONAL/CONTINENTAL PREPAREDNESS

Name of regional/continental organization:

Countries represented:

Point of contact details:

Name:

Title:

Phone:

Address:

E-mail address:

Date of Completion:

For each item, check only 1 of 4 boxes: Yes, No, Unknown, or Not Applicable (N/A).

Submit your completed checklist to Rinderpest-Secretariat@fao.org to have your region's preparedness status evaluated and to seek support for improving preparedness.

DOES YOUR REGIONAL/CONTINENTAL ORGANIZATION HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	DEADLINE	NO	UNKNOWN	N/A	COMMENTS CHALLENGES
1. Authority and frameworks						
Authority and scope of the organization to engage in rinderpest (and other transboundary animal diseases [TADs]) emergency management activities						
Framework to support rinderpest capacity building in countries						
Authority and framework to identify rinderpest stakeholders and support awareness raising and information sharing						
Framework to support regional/continental rinderpest surveillance						
Authority to declare a rinderpest emergency in the region/continent						
Authority to coordinate a regional/continental response through an animal health emergency operations centre						
Emergency funding dedicated to support emergency management capabilities for rinderpest						
Director of regional organization has access to this emergency funding						
Mechanism for recruitment of donor funding for emergency response and authority for using funds throughout region						

DOES YOUR REGIONAL/CONTINENTAL ORGANIZATION HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	DEADLINE	NO	UNKNOWN	N/A	COMMENTS CHALLENGES
Authority and framework to mobilize resources to countries to support rinderpest emergency management, including funding to support detection (surveillance, laboratories) and response (supplies), and deployment of experts						
Authority and framework to collaborate with FAO and OIE in rinderpest emergency management, including resource mobilization						
2. Regional/continental emergency management plans						
A risk analysis for a rinderpest outbreak in the region has been conducted						
A risk analysis for spread of rinderpest from a neighbouring region that may be at risk for the re-emergence of rinderpest has been conducted						
Regional/continental rinderpest strategy/plan. If so, under Comments, list the year published.						
Plans to support rinderpest information sharing from national veterinary authorities to the regional/continental organization						
Regional/continental mechanism for rumour tracking						
Communication standard operating procedures (SOPs) for early warnings to rinderpest at-risk countries in the region/continent						
SOPs to estimate amount of rinderpest diagnostics and vaccines needed in the region/continent to respond to a rinderpest response						
Source of rinderpest vaccine identified for the region						
Mechanism to assist countries obtain rinderpest vaccine						
Mechanism for prioritizing the allocation of vaccine to affected and at-risk countries in the region						
SOPs for resource mobilization, particularly during response stage						
3. Equipment / technical capacity						
Equipment and mechanism (e.g. webinars, websites) to support awareness raising and information sharing for rinderpest in the region/continent						
Equipment and supplies to support countries in the collection of live animal and post-mortem samples for rinderpest diagnostics						
Mobilization of rinderpest experts from the region/continent to assist countries in rinderpest emergency management						

DOES YOUR REGIONAL/CONTINENTAL ORGANIZATION HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	DEADLINE	NO	UNKNOWN	N/A	COMMENTS CHALLENGES
4. Training						
Rinderpest stakeholders identified in the region/continent						
Mechanism for measuring and monitoring awareness of rinderpest among stakeholders						
Development and distribution of educational and advocacy tools for stakeholders to maintain awareness about rinderpest and the Global Rinderpest Action Plan (GRAP) with the aim to enhance reporting of suspect cases						
Advocacy and promotion for countries to feature rinderpest in all national veterinary curricula						
Regional Good Emergency Management Practice (GEMP) training conducted on rinderpest emergency management						
Sponsoring of training for stakeholders on the GRAP and the regional rinderpest strategy/plans						
5. Exercise						
Multiyear schedule to conduct rinderpest exercises, both discussion-based and operations-based, to test plans, equipment and training						
Discussion-based exercises conducted						
Operations-based exercises conducted						
After-action reviews of plans, equipment and training conducted						
Development and implementation of improvement plans to update plans, equipment and training						

CHECKLIST FOR INTERNATIONAL PREPAREDNESS

Name of international organization:

Point of contact details:

Name:

Title:

Address:

E-mail address:

Date of completion:

For each item, check only 1 of 4 boxes: Yes, No, Unknown, or Not Applicable (N/A). For those activities where completion is scheduled, please provide the scheduled date of completion under deadline.

DOES THE INTERNATIONAL ORGANIZATION HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	DEADLINE	NO	UNKNOWN	N/A	COMMENTS CHALLENGES
1. Authority and frameworks						
Dedicated framework for rinderpest emergency management						
Mechanism for rumour tracking						
Reporting lines for a disease outbreak report to progress from the field to the international organization						
Framework to monitor surveillance and global status of rinderpest						
Oversight for international rinderpest reference centres/ laboratories that are authorized to conduct rinderpest analysis						
Mechanism for interaction with INTERPOL						
Authority and framework to develop rinderpest diagnostics and vaccines						
Authority to suspend recognition of global freedom status following confirmation of rinderpest						
Mechanism to engage multisectoral incident coordination for rinderpest						
Mechanism for identification of funding to support rinderpest emergency missions to at-risk countries						
Authority and framework for emergency funding dedicated for support of countries for rinderpest emergency management						
The veterinary authority has access to emergency funding						
Authority and framework to sponsor research to improve the availability/quality of rinderpest diagnostics and vaccines						

DOES THE INTERNATIONAL ORGANIZATION HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	DEADLINE	NO	UNKNOWN	N/A	COMMENTS CHALLENGES
2. International emergency management plan						
A global risk analysis for a rinderpest outbreak has been conducted						
Development and maintenance of an international Global Rinderpest Action Plan (GRAP)						
Strategy to encourage periodic recommendations for improvements in diagnostics and vaccines for more effective control of outbreaks						
Standard operating procedures (SOPs) for identification and deployment of technical resources to support emergency preparedness missions to at-risk countries and emergency response missions to countries managing an outbreak						
Protocols for countries to obtain rinderpest vaccine quickly upon request						
3. Equipment / technical capacity						
Access to rinderpest experts and mechanism to deploy to countries to provide assistance						
International rinderpest reference centres/laboratories that are authorized to conduct rinderpest analysis						
Development and maintenance of non-infectious diagnostic tests for rinderpest that can be deployed to a country facing a rinderpest outbreak						
Development and maintenance of rinderpest vaccine stockpile						
4. Training						
Global stakeholders for maintenance of the global freedom from rinderpest identified						
Mechanism for measuring and monitoring global awareness of rinderpest among stakeholders						
Development and distribution of educational and advocacy tools for stakeholders to maintain awareness about rinderpest and the GRAP with the aim to enhance reporting of suspect cases						
Sponsoring of training in Good Emergency Management Practice (GEMP)						
Participation in or provision of information for rinderpest education and training at the national, regional/continental and international levels						
Sponsoring of training required for processes at rinderpest holding facilities (RHF) and rinderpest labs to support outbreak needs						
Sponsoring of training for International Air Transport Association (IATA) certification						

DOES THE INTERNATIONAL ORGANIZATION HAVE THE FOLLOWING PREPARATIONS IN PLACE TO MANAGE RINDERPEST?	YES	DEADLINE	NO	UNKNOWN	N/A	COMMENTS CHALLENGES
5. Exercise						
Multiyear schedule to conduct rinderpest exercises, both discussion-based and operations-based, to test plans, equipment and training						
Discussion-based exercises conducted						
Operations-based exercises conducted						
After-action reviews of plans, equipment and training conducted						
Development and implementation of improvement plans to update plans, equipment and training						

ANNEX 2

RINDERPEST VACCINE RESERVE AND VACCINATION

PART A

OPERATIONAL FRAMEWORK FOR THE MANAGEMENT AND DEPLOYMENT OF THE RINDERPEST VACCINE RESERVE

INTRODUCTION

BACKGROUND

According to the Guidelines for Rinderpest Virus Sequestration (Appendix to OIE Resolution No. 18 [OIE, 2011]), the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE) shall widely publicize the availability of internationally accessible rinderpest vaccine stocks in order to encourage national authorities to destroy or transfer their respective country's holdings of rinderpest virus-containing materials (RVCM). The organizations are also responsible for jointly developing a set of guidelines and standard operating procedures (SOPs) to govern the maintenance of rinderpest vaccine stocks in facilities designated as rinderpest holding facilities (RHF) and their use for emergency purposes.

The Category B RHF hold the rinderpest vaccine reserve (RVR) and are crucial for the deployment of vaccine in an emergency situation. As part of their RHF mandate (OIE,

2014) they are expected **to contribute, when requested by FAO and the OIE, to the global rinderpest vaccine bank and preparedness strategy, including through the emergency manufacture and preparation of vaccines.**

In accordance with their mandate, FAO and the OIE will ensure that the RVR is transparently managed, and that FAO and OIE Members benefit from a vaccine deployment process with clear instructions and efficient ways for vaccine distribution and administration. Moreover, FAO and the OIE will engage relevant stakeholders to safeguard the long-term sustainability of the RVR.

Currently, the RVR consists of a stock of LA-AKO vaccines, stored at the National Institute of Animal Health (NIAH), in Tsukuba, Japan, and a stock of RBOK vaccine, stored at the Pan African Veterinary Vaccine Centre of the African Union in Ethiopia. There is a residual number of vaccine vials that remain stored in institutes that are not designated RHF. These institutes are encouraged to either destroy or sequester their vaccine stocks to one of the aforementioned facilities.

PURPOSE

This Operational Framework describes the management considerations and policy pertaining to the RVR held by the FAO–OIE designated Category B RHF. It also describes the deployment procedures to Members requesting vaccine in the event of an emergency resulting from rinderpest re-emergence.

This document takes into consideration the OIE standards pertaining to rinderpest and vaccine banks (OIE, 2017, 2018a), and the analogous document from the World Health Organization (WHO) concerning the deployment of the WHO smallpox vaccine emergency stockpile (WHO, 2017). It will be updated as needed in accordance with the GRAP in order to reflect the evolution and development of research, policies and standards.

ESTABLISHMENT

PROCEDURE FOR DESIGNATION OF CATEGORY B RINDERPEST HOLDING FACILITIES

Institutions holding rinderpest vaccines or rinderpest vaccine production reagents may apply to become a Category B RHF. FAO and the OIE have developed, through consultation with leading experts and relevant stakeholders, a series of criteria that vaccine manufacturers must comply with in order to be eligible for producing rinderpest vaccine. These criteria will be available upon request from the Rinderpest Secretariat. To submit an application, the country or institution must also contact the Rinderpest Secretariat and provide a letter of support from the country's chief veterinary officer, as well as the completed application form (FAO and OIE, undated). The application should also include a copy of: the institution's biosafety manual; the rinderpest national contingency plan, and the curriculum vitae of the staff involved. After assessment of the application by the Rinderpest Secretariat and the FAO–OIE Rinderpest Joint Advisory Committee (JAC), if it is deemed that the institute fulfils the necessary requirements to be a candidate RHF, a team of independent experts designated by FAO and the OIE will inspect the facility. Following the on-site inspection and review of the resulting report by

the Rinderpest Secretariat and presentation of findings to the JAC, a recommendation for the designation by FAO and the OIE may be issued.

If the JAC recommends the facility be designated, and FAO and the OIE agree to do so, both organizations move forward to formalize the designation. A resolution that proposes the approval of the institution as a Category B RHF is presented for adoption at OIE World Assembly of Delegates. Subsequently, the requesting institute must agree to be legally bound to the established Terms and Conditions for the final designation as an FAO–OIE RHF. The facility is designated for a period of three years, and if after that period it wishes to maintain its Category B status, the RHF shall be re-evaluated by FAO and the OIE before the end of its term.

ROLES AND RESPONSIBILITIES OF RINDERPEST HOLDING FACILITIES

The Category B RHF should manage their vaccine stocks by regularly validating or destroying stocks of expired vaccines (using the SOPs approved by FAO and the OIE), by performing quality-control testing, and by accepting vaccine virus seeds or stocks from FAO and OIE Members for safe storage and/or for destruction.

All Category B RHF shall provide vaccine virus seeds or vaccines to other institutes for research or for vaccine manufacture that have been approved by FAO and the OIE, and they shall contribute, when requested by FAO and the OIE, to the RVR and to the implementation of the Global Rinderpest Action Plan (GRAP), including the emergency manufacture and preparation of vaccines.

The list of the currently designated RHF can be found on the FAO and OIE rinderpest web pages (FAO, 2018a, OIE, 2018b).

PARTNERSHIPS

Considering the current size of the RVR and the potential need to produce large volumes of vaccine on demand, Category B RHF are encouraged to consider entering into formal partnerships with vaccine manufacturers and financial donors. Partnerships or contracts with vaccine

manufacturers may be necessary to produce (initial) physical stocks, produce vaccine on demand (either for replenishment or for surge capacity), produce or procure diluent, and to potentially facilitate the transportation of vaccine to destinations under IATA protocol.

Financial partnerships may also be necessary to assist with costs associated with maintaining and replenishing vaccine stocks, as well as additional costs incurred if large scale production becomes necessary. The OIE Terrestrial Manual chapter on vaccine banks should be used as a reference for approaches (OIE, 2018a).

VACCINE CRITERIA

The RVR shall maintain formulated live-attenuated tissue culture derived vaccine. The vaccines shall be RBOK and/or LA-AKO strains and shall be produced in accordance with the OIE Terrestrial Manual (OIE, 2018a).

Considerations on the size of the RVR

The size of the RVR has not been fixed, and it varies according to the situation of each Category B RHF. According to the specific circumstances of the outbreak, the global RVR is to be used for rapid response in short-term, limited interventions. The number of doses to be stored is dependent on the epidemiological considerations associated with a potential re-emergence of rinderpest. With the disease eradicated from its natural animal hosts, the most likely scenario for its re-emergence would be an accidental or deliberate release from a facility holding RVCM. Therefore, the size of the reserve necessary depends on the size and density of the susceptible population in areas of high risk including, but not limited to, populations near facilities holding rinderpest virus. The reserve size is also dependent on the anticipated effectiveness of the response in an outbreak including: immediacy of stop movement measures; how quickly the susceptible population could be vaccinated to achieve herd immunity; and if other eradication measures such as stamping out are employed.

Vaccine from the RVR would only be released for purposes of assisting containment measures where an outbreak of rinderpest has been declared by FAO and the OIE. In the case of a sustained, widespread rinderpest outbreak,

additional production of rinderpest vaccine would need to occur.

Selection of manufacturers

FAO and the OIE have developed, through consultation with leading experts and relevant stakeholders, a series of criteria with which vaccine manufacturers must comply in order to be eligible for producing rinderpest vaccine either in an emergency situation or for replenishment of the current reserves. Rinderpest vaccine shall only be produced by manufacturers that comply with these requirements. Category B RHF may establish agreements and partnerships with such manufacturers for that purpose, after notifying FAO and the OIE of such intention and receiving approval to do so from the Rinderpest Secretariat. Vaccine virus seeds and other materials for their production shall be stored at Category B RHF and only sent to manufacturers when production is imminent.

Types of strains

According to the OIE Terrestrial Manual (OIE, 2018a), two strains of live attenuated rinderpest vaccine can be maintained in the Category B RHF and used for emergency vaccination: LA-AKO and RBOK. RBOK vaccine was used effectively for cattle and buffalo in the Indian subcontinent, the Near East and Africa in the control and eradication of rinderpest, whereas LA-AKO vaccine was primarily used on highly susceptible cattle in East Asia, such as Japanese Black and Korean Yellow.

Regulatory considerations

As global freedom from rinderpest was declared, rinderpest vaccines may not be registered and/or licensed in most countries. In the case of confirmation of a rinderpest outbreak, and should there be the choice to vaccinate, affected countries may be required by their government authorities to undertake emergency registration of vaccines. If so, protocols for rapid registration should be developed within contingency plans as encouraged by the GRAP. Manufacturers of rinderpest vaccine maintained in the RVR may also compile and maintain a registration dossier that would be available to countries for accelerating registration/licensing and importation procedures.

The rinderpest vaccine to be deployed should therefore have the following characteristics:

- It has been approved or registered, possibly through emergency procedures, by the recipient country.
- It has been produced in compliance with the standards described in the OIE Manual section on recommendations for the manufacture of vaccines (OIE, 2018a).
- The production process would have ensured that rinderpest vaccines, vaccine strains and other materials related to rinderpest vaccine production, including cell seeds and unfinished products, are managed separately, independently maintained, and manipulated away from other products in a facility dedicated (temporarily or permanently) to rinderpest vaccine production, and securely stored at appropriate conditions to avoid unexpected contamination, leakage and misidentification.
- Finished products shall be stored with appropriate labelling to facilitate batch-based management of vaccines held in the RVR.
- It has been derived from batches produced in facilities approved by FAO and the OIE.
- It has been deployed with full record and traceability from the production site to the RHF and to the requesting country.

Prior to each rinderpest vaccine production campaign (one-off or on a recurring basis), the manufacturing facility shall prove compliance with FAO and OIE requirements for such purpose on each occurrence. These manufacturers would receive working/production seed from FAO–OIE-approved RHF’s once such material is needed to start production.

Assessment of finished products by the national authority
Quality-control operations performed by independent institutions such as the national authority are considered fundamental to guarantee safe and effective operation of vaccines. The set of applicable tests may vary depending on the institution; however, *in vitro* virus titration is essential to evaluate the efficacy of finished products. RVR stocks shall be re-evaluated for potency at expiration

of their shelf lives. Prolongation of shelf life is subject to approval by FAO and the OIE.

The Category B RHF’s shall collaborate in the implementation of harmonized quality-control test procedures for RVRs, maintenance of stock, and procedure for deployment of RVR stocks.

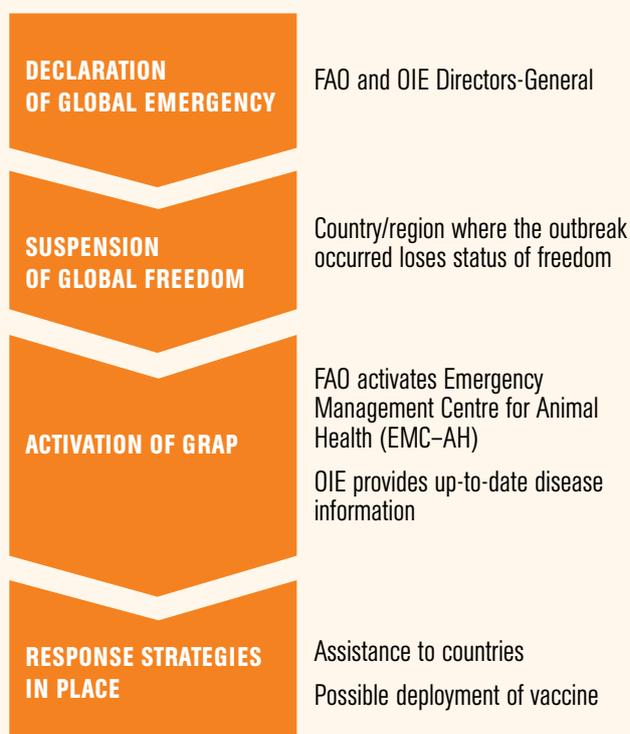
DEPLOYMENT

This section describes the actions to be undertaken following confirmation of a rinderpest case.

ACTIVATION

- A case of rinderpest confirmed by an FAO/OIE rinderpest reference centre/laboratory using a prescribed test is the trigger for activation of the Response actions identified in the GRAP, including the involvement of the RVR, and shall constitute a global emergency requiring immediate, concerted action for its investigation and elimination.

Figure A2.1. Steps following the declaration of a global emergency

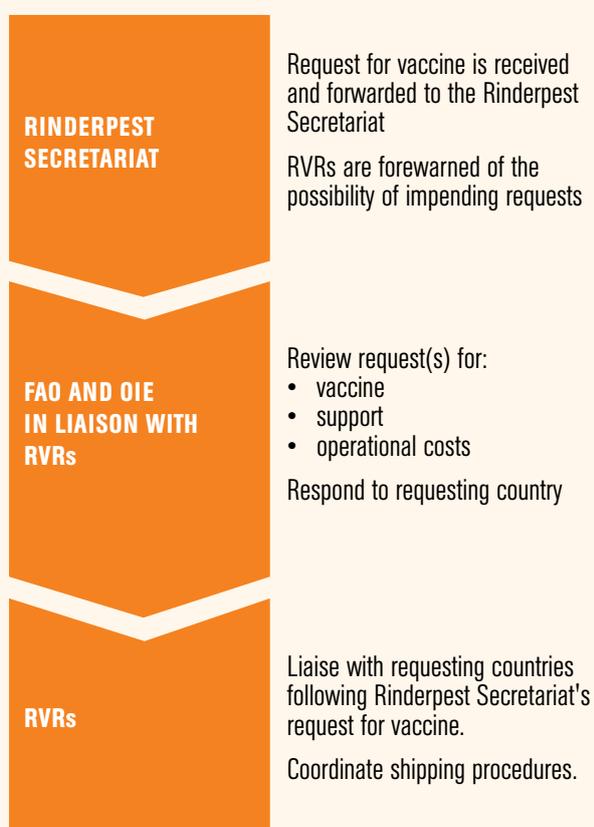


- Immediately following the case confirmation, the FAO/OIE rinderpest reference centre/laboratory should inform the national authority of the affected country, and the Rinderpest Secretariat. The FAO and OIE Directors-General shall declare the status of a global emergency and inform the international community through a joint statement, as illustrated in Figure A2.1.

OFFICIAL REQUEST FOR VACCINE

- In accordance with the GRAP, the competent national authority in the affected country may request rinderpest vaccine by promptly submitting the “Official Request for Vaccine” (FAO, 2018; OIE, 2018b).
- The Rinderpest Secretariat will manage the requests sent by national authorities for vaccines from the RVR under the authority of the Directors-General of FAO and the OIE, as illustrated in Figure A2.2.

Figure A2.2. Vaccine request management



- The response to the request will be based on the information provided by the requesting country, including: epidemiological considerations, extent of the outbreak, vaccination strategy, the country's capacity to implement the vaccination campaign, the number of vaccine doses requested, and the number of doses stored in the RVR.
- The decisions concerning supply of vaccines and provision of technical support and/or support for operational costs will be made by FAO and the OIE based on the content of the submission form and the aforementioned considerations. The RVRs will be consulted on the release of the vaccine doses and deployment of vaccine to the affected countries.
- Details regarding any supply of vaccine, including the quantities and logistics, anticipated delivery timelines and destinations, and the eventual provision of technical support and support for operational costs will be communicated by the Rinderpest Secretariat to the Government of the requesting country.

COORDINATION OF DEPLOYMENT PROCEDURES

The vaccines for immediate and primary deployment in emergency situations shall be finished products – having been evaluated for quality, packaged and have clear instructions for administration. The shelf life of vaccines shall be determined by evidence-based assessment prior to deployment. It is recommended that monitoring of the virus titre of reserve vaccines be performed regularly.

Release of bulk antigen is a possible secondary option in RVR deployment. Category B RHF should conduct quality-control operations before storage to ensure rapid processing of the frozen antigen upon deployment.

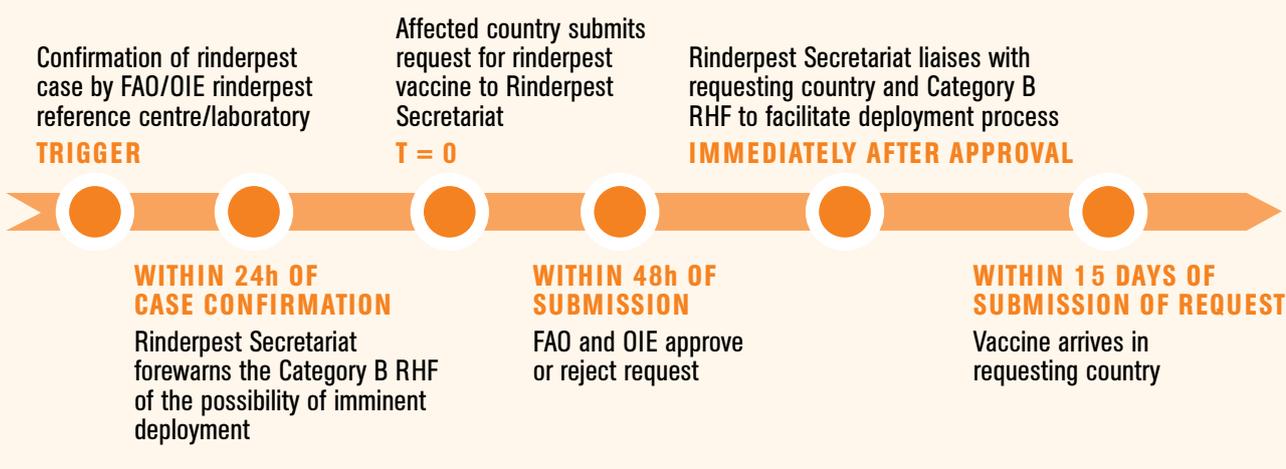
All rinderpest vaccine stocks shall be certified for identity, potency and freedom from extraneous agents, according to the OIE Manual chapter on infection with rinderpest virus (OIE, 2018b).

LOGISTICAL CONSIDERATIONS

Once the FAO/OIE rinderpest reference centre/laboratory has confirmed a case of rinderpest, it is critical that

the subsequent activities be completed as efficiently as possible in order to limit the spread of the infection. Figure A2.3 depicts a suggested timeline.

Figure A2.3. Timeline following confirmation of a case of rinderpest



SHIPPING

Shipping of rinderpest vaccine should be done according to the FAO–OIE SOP for handling, packaging and shipping of RVCM (FAO and OIE, 2016).

Rinderpest virus is classified as Dangerous Goods (UN2900). To transport rinderpest virus by air, the Dangerous Goods Regulations issued by International Air Transport Association (IATA) should be followed (IATA, 2018). Additional and up-to-date information on international shipping of infectious agents can be obtained online from IATA and the WHO. All persons directly involved in transport of Category A infectious substances, including the shipper, must have been appropriately trained and certified within the past two years to package and ship such materials under international guidelines and regulations.

Category B RHF and requesting countries shall identify, in advance, courier services that can handle

and transport Dangerous Goods UN2900 by air with dry-ice cooling. The recommendation is to use an international courier specialized in transporting infectious substances, and one with an established reputation for doing so. Agreements with such carriers and freight forwarders should be done in advance. A Dangerous Goods Declaration must be prepared and signed by the trained person. The box must be marked and labelled correctly in accordance with the Dangerous Goods Regulation. The box should be accompanied by a material safety data sheet for rinderpest virus (FAO and OIE, 2016a), and this should also be supplied to the courier along with standard shipping documentation. Moreover, security measures and personnel for transport of the shipment to the airport should be considered in order to prevent theft and to ensure seamless transport.

As recommended in the GRAP, shipping and receiving simulation exercises should be conducted frequently to ensure that vaccine delivery will not be delayed.

GLOBAL FINANCIAL CONSIDERATIONS

Funding will be required for rapid access to vaccine and for management of operational costs while responding to a rinderpest outbreak on the global level. These funds should be made available promptly after the declaration of suspension of global freedom. Although the vaccine in the RVR would ideally be procured, prepaid or donated in advance as part of the GRAP, emergency funds would still be needed to cover operational costs such as transportation, insurance, and customs clearance/import fees. In addition, emergency funds may be necessary to conduct the vaccination campaign. Operational costs should correlate with the number of doses in stock, meaning that donated funds should consider the size of the RVR they are meant to support – either at global level or a specific reserve.

Additional funds would be necessary to ensure maintenance of the RVR in terms of quality-control testing, cold chain and insurance. The funds should cover costs related to replacement of expired vaccine, vaccine that is no longer within the specifications, or vaccine used to respond to an outbreak. Donors or countries involved in the emergency shall contribute towards the replenishment of vaccine stocks deployed during an emergency, while the owners of the vaccine in question shall replenish stocks that are withdrawn due to expiration.

Vaccine production should commence immediately after a request for vaccine is received or whenever it is necessary to replenish the RVR for other reasons. Provisions should be made through procurement contracts or donation agreements with vaccine manufacturers to maintain production facilities available in case of an emergency; therefore, there may be additional expenditures to maintain emergency production capacity.

REPLENISHMENT OF VACCINE STOCKS

Rinderpest vaccine production should be initiated for replenishment of stocks either due to deployment in the event of an outbreak or due to expiration of such stocks. Donors or countries involved in the emergency shall contribute towards the replenishment of vaccines stocks deployed during an emergency, while the owners of the vaccine in question shall replenish stocks that are withdrawn due to expiration.

Approval for replenishment or expansion of RVR stocks shall be given by FAO and the OIE following consideration of a formal request submitted to the Rinderpest Secretariat.

PART B

RINDERPEST VACCINE AND VACCINATION

There are distinct strategies that could be incorporated into a country's response plan for use in the event of an outbreak of rinderpest. According to the recommendations issued by the Global Rinderpest Eradication Programme (GREP) for addressing outbreaks in areas previously free from disease (OIE, 2011), a stamping-out policy combined with ring vaccination (vaccination of cattle in contact with the confirmed case as well as other susceptible livestock in the infected zone), and complete restriction of animal movement is the most effective method for containing and eliminating disease (Figure A2.4). Should there be a large-scale outbreak, as defined in the GREP, the establishment of sanitary boundaries is advisable. Emergency vaccination is acceptable only with vaccine of the appropriate strain received from the RVR.

For purposes of disease control and elimination, an epidemiological investigation must be conducted that uses diagnostic techniques to indicate the extent of the

infected area. Infected and protection zones can then be defined according to OIE Terrestrial Code chapter on zoning and compartmentalization (OIE, 2017).

The strategy chosen by the affected country for control and elimination of disease will determine the length of the waiting period required by the OIE to recover the rinderpest-free status of a country.

The request for vaccine from the RVR must include an outline of the anticipated vaccination campaign. In addition, after implementation of the vaccination campaign the requesting country shall provide feedback to the Rinderpest Secretariat using the appropriate feedback form (FAO, 2018; OIE, 2018b).

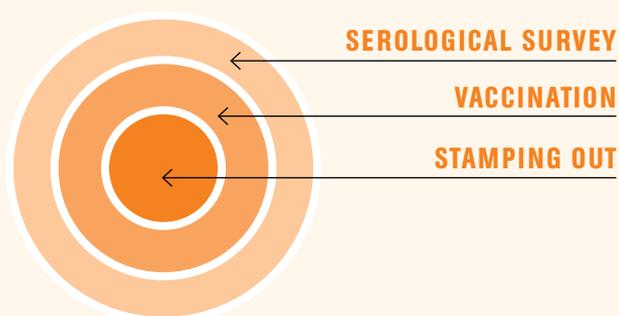
CHARACTERISTICS OF THE PROTECTIVE RESPONSE TO RINDERPEST VACCINE

Inoculation of susceptible animals with a standard dose of rinderpest vaccine induces protection against virulent rinderpest virus (RPV) within at least 3–4 days. Depending upon the serological test used, RPV-specific antibodies are detectable from day 5 or 6 until day 14. Thereafter, antibody titres (and thus protection against infection) remain high or decline very slowly and are readily detectable in vaccinated and recovered cattle for at least ten years (Plowright and Ferris, 1959).

VACCINE PREPARATION AND DELIVERY

The vaccine should be reconstituted and applied according to the specific manufacturer's direction. In general, if the rinderpest vaccine supplied is the thermotolerant

Figure A2.4. Method for containing and eliminating disease



form, it does not need to be maintained in a cold chain before reconstitution, but this must not be abused in hot weather conditions. If the freeze-dried vaccine is not the thermotolerant form, it must always be kept at or below 4–8 °C before reconstitution. Reconstitution is carried out by suspending the freeze-dried vaccine in the supplied diluent. The most commonly used recommended diluent is sterile normal saline. Distilled water should not be used as a diluent. After reconstitution, both thermotolerant and non-thermotolerant vaccine must be kept in the cold chain at 4–8 °C, but not frozen, preferably in dark glass bottles or some other container that protects it from direct sunlight. The vaccine is inoculated subcutaneously, usually at the neck or pre-cural area of the animal. All vaccinated animals must be marked permanently.

Vaccination teams should be trained with the reconstitution and use of freeze-dried live virus vaccines, including the absolute requirement for an effective cold chain and rapid use of the vaccine after reconstitution. The reconstitution and use of rinderpest vaccine are identical to that for Peste des Petits Ruminants (PPR) vaccine.

APPROACH TO VACCINATION

All susceptible animals in the infected area and the surrounding protected area (the vaccination target area) that do not show clinical signs of rinderpest must be vaccinated. The infected area is:

- a** the herds and units in which clinical cases of rinderpest have been confirmed and where the same clinical syndromes continue to be evident in new animals, and it may also include:
- b** neighbouring herds and units of susceptible animals known to have been in contact with the infected herds and units described in a) and, therefore, at higher risk of being infected. One should expect to find some infected animals in the incubation period or very early clinical stage of rinderpest in both categories.

The protection area is the population of susceptible livestock immediately adjacent to, and completely surrounding, the infected area. The width of this area

will be determined by local experience of the transmission of other infectious diseases of livestock in this area, and/or intensive clinical surveillance, and epidemiological knowledge of the livestock production system. In principle, the more mobile a livestock population is, the wider the protective area should be. Similarly, where absolute quarantine is difficult to achieve, the protection area should be wider.

In areas where susceptible livestock are kept under relatively sedentary conditions, it may be possible to define the infected and protected areas more accurately using intensive disease surveillance. Under these conditions, and if the disease was detected early, the size of the infected and protection areas may be relatively small, perhaps a radius of one or less than one kilometre for the infected area, and a similar or comparable distance for the protection zone. Where livestock are not kept under intensive conditions, or where intensive clinical surveillance is not possible, the infected area and protection area may be larger, perhaps with a radius of several kilometres.

In principle, the more intensive the surveillance that can be focussed on defining the infected area and understanding the epidemiological situation, the less vaccine should be required. Another principle is that the quicker the vaccination can be carried out, the more effective it will be. In the post-eradication era, all susceptible animals in the target area should be vaccinated. Cell-culture derived RPV vaccine has been shown to be extremely safe in all breeds of cattle and domestic buffaloes. It can also be given to all young stock as soon as they have been born, to pregnant and recently calved cows, and even to weak or malnourished cattle (Plowright and Ferris, 1959).

RESPONSIBILITIES OF COUNTRIES RECEIVING RINDERPEST VACCINE

In addition to complying with FAO and OIE requirements for activation of the RVR, countries requesting vaccine shall consider and make all necessary logistical and regulatory requirements including, but not limited, to the following:

- Permits – Under certain circumstances, national authorities may require specific market authorization, import, transit, and customs clearance documentation. It shall be the responsibility of requesting countries to ensure that such documentation is prepared and made available where appropriate.
- Cold chain – Live attenuated rinderpest vaccines must be transported and stored in accordance with manufacturers' specifications, typically at 4–8 °C, or as described as appropriate. Therefore, requesting countries must ensure that, when necessary, cold chain facilities for transportation and storage of vaccines are available from the time they leave the RVR until they are administered to livestock. Cold chain monitoring records must be kept to ensure vaccines efficacy at the time of administration.
- Vaccine supplies – The national authorities of requesting countries should ensure that ancillary items (e.g. syringes, needles, cooler boxes, personal protective equipment, and permanent animal marking equipment) required for carrying out an effective vaccination campaign are available and stored in sufficient quantities.
- Vaccination administration – Vaccination teams must be established, trained, and provided with clearly defined vaccination protocols and other necessary documentation and resources as outlined in NCPs.

VACCINATION STRATEGIES

RING VACCINATION

A classical vaccination strategy is to “ring vaccinate” the infected and protection areas. As many teams as deemed appropriate begin to vaccinate cattle at the outer limit of the protection area, then progressing through the protection area and continuing into the infected area. The aim must be to vaccinate all cattle as soon as possible. Epidemiological characteristics of the outbreak, such as cattle density, animal movement, and human movement, should be considered in the vaccination strategy, with the aim of containing the spread of the viral infection within a limited geographical area.

In the infected area, the benefit of vaccinating cattle in herds and villages where there are or have been clinical cases of rinderpest must be considered carefully. With protection provided by vaccine within 3–4 days, complete vaccination of all high-risk cattle is almost as effective at removing susceptible animals as slaughtering them. Where all clinical cases of rinderpest have been thoroughly segregated from clinically normal cattle (an important sanitary measure), it is possible to vaccinate the clinically normal cattle. This was widely done in the earlier vaccine-based control of rinderpest and during the final eradication phase. Animals incubating the virulent virus will continue to develop clinical disease (which must be explained to the owners). However, all or most uninfected animals will be successfully immunized. Vaccination in these herds and village units must be carried out by separate “dirty” teams that are fully decontaminated when they leave the area, especially if they are to be used elsewhere in the protection zone.

In the past, the iatrogenic spread of RPV infection by vaccination teams was not considered significant and vaccination into the “face” of the epidemic was widely practised. However, some veterinary authorities may prefer not to vaccinate in the infected area; in which case, intensive disease surveillance will be required to monitor the spread and eventual cessation of virus transmission in this area. It is likely that virus transmission will continue for longer if all animals in the infected area are not vaccinated.

During the rinderpest era, there was no evidence from the field to suggest that using live rinderpest vaccine in animals already infected with circulating virulent RPV had any deleterious effect.

TARGETED VACCINATION

Where intensive disease surveillance is available, an alternative to ring vaccination is targeted vaccination. This strategy makes use of disease and epidemiological “intelligence” to detect and define more precise and localized infected and protection areas. This strategy proved itself effective during the final stages of the eradication of RPV from the last two known endemic areas in Africa. In its most targeted form, it is used to control individual outbreaks and contiguous “at-risk” herds. Such outbreak control has been applied successfully to the control of PPR and could be equally effective against rinderpest. It is probably the most economic tactic for the use of vaccine, which may be important where “vaccinate to slaughter” may be the chosen policy to mitigate an outbreak of rinderpest, or where vaccine is in short supply.

GEOGRAPHICAL OR ADMINISTRATIVE AREA-BASED VACCINATION

During rinderpest eradication, another tactic for vaccination was sometimes used where cattle movements were extensive, effective quarantine was difficult to impose, and disease surveillance was limited. Under these conditions, it was, and remains, almost impossible to realistically define infected and protection areas. If the disease was known to be occurring in one **geographical unit** (such as an enclosed valley), an **epidemiological unit** (such as the grazing territory covered by specific groups of cattle herders), or an **administrative unit** (such as a subcounty or division of a larger county or district or state of a country), then vaccination would be carried out throughout this defined zone. As with the other methods, it must be supported by intensive disease surveillance and investigation in and around the chosen zone. This strategy is less precise than ring vaccination or targeted vaccination and may lead to the use of more vaccine. It should only be used if ring vaccination or targeted vaccination cannot be used.

MONITORING AND EVALUATION

MANAGEMENT OF VACCINATION

During vaccination, it is necessary to monitor the progress of the overall effort and of individual teams. If the target area is not extensive, if animal movement is controlled, and if the number of vaccination teams is sufficient, the incidence of new cases should begin to decline rapidly within 1–2 weeks. If the disease continues to spread throughout the target area, there is a major problem with the quality of the vaccine or with its overall delivery, and it must be addressed immediately. If the disease continues to spread in smaller defined locations, this may be due to ineffective vaccination by one or a small number of vaccination teams, which must be addressed and rectified.

It will be important to monitor and tally daily vaccination records, comparing these with estimated cattle numbers in the target area, with a view to assess possible requirements for additional vaccine.

STOPPING VACCINATION

Vaccination should stop as soon as the target population has been fully covered, and when intensive surveillance reveals no cases of rinderpest outside the target zone. If vaccination has been carried out very quickly, it is possible that a small number of cases may occur in the target area, especially in the infected area, within 1–2 weeks after starting vaccination. These cases will be cattle infected just before or just after vaccination, and such cases should be expected.

SERO-MONITORING OF VACCINATION

Serological testing for specific antibodies to RPV in pre- and post-vaccination serum samples collected from marked animals was a widely used technique for assisting the management of routine rinderpest vaccination campaigns. However, it was less commonly used in emergencies and outbreak control. This technique, sero-monitoring, could provide useful information in an emergency where vaccination does not work well. The results must be interpreted with care because current

rinderpest vaccines and serological tests do not allow distinguishing between vaccinated and naturally infected animals. The time spent in shipment and testing of serum samples must be as short as possible for the results to be of value to decision makers. FAO and the OIE may be in a position to facilitate the provision and deployment of field diagnostic tools.

ASSESSMENT OF DEPLOYMENT PROCEDURE

The deployment procedure shall be assessed and documented by the Rinderpest Secretariat. A report including information provided by the requesting country and the RHF shall be issued. Compliance with the initial strategy, use of the vaccine, and additional control and elimination measures put in place by the country shall be documented and scrutinized.

ASSESSMENT OF THE IMPLEMENTATION OF THE VACCINATION CAMPAIGN BY REQUESTING COUNTRIES

Upon request of vaccine from the RVR, the outlines of the vaccination campaign must be described as requested in Section VI of the Official Request for Rinderpest Vaccine (FAO, 2018; OIE, 2018b). After implementation of the

vaccination campaign, the requesting country shall provide feedback to the Rinderpest Secretariat using the form provided (FAO, 2018; OIE, 2018b).

The Rinderpest Secretariat will assess the feedback report on the vaccination strategy initially provided. Challenges encountered during the implementation of the campaign should be reported for facilitating future deployment procedures.

Requesting countries are expected to safely destroy the remaining vaccine after completion of the vaccination campaign. This should be done in accordance with the FAO/OIE SOP for Destruction of RVCM (FAO and OIE, 2016b).

Should a country require additional deployment of vaccine for the same or a subsequent outbreak, the Rinderpest Secretariat would use the assessment of the previous vaccination campaign when evaluating the additional request for vaccine.

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ANNEX 3

CONTACT DETAILS FOR RINDERPEST EMERGENCY MANAGEMENT

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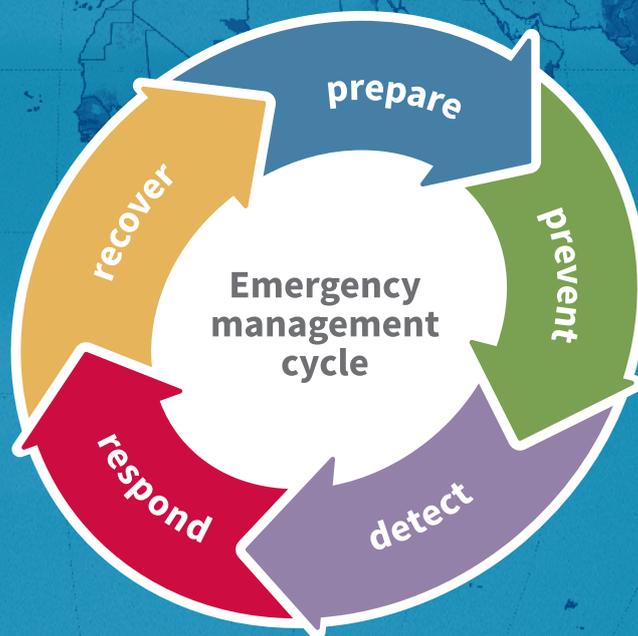
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The Global Rinderpest Action Plan (GRAP) is the international operational plan that addresses activities related to the potential re-emergence of rinderpest. The GRAP applies an emergency management cycle approach to prepare for, prevent, detect, respond to and recover from a potential re-emergence of rinderpest, and it addresses responsibility for each stage of the cycle at the national, regional/continental, and international levels.

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