



Biological threat reduction

Animal disease agents, including those transmissible to humans, have the potential to escape by accident from laboratories or to be used as biological weapons because of their wide ranging economic, health and social impacts and their potential availability. Countries that apply good veterinary governance are best placed to detect and rapidly respond to all animal disease outbreaks, whether they are naturally occurring or the result of accidental or intentional release of pathogens, in order to prevent potential biological disasters.

KEY FACTS

- 80% of pathogens that could potentially be used for bioterrorism are of animal origin.
- 60% of human infectious diseases evolve from animal pathogens.
- 75% of emerging human infectious diseases have an animal disease origin.
- The OIE is working to ensure that our world is safe and secure from the accidental or intentional release of animal pathogens (including zoonotic agents).
- Early detection and rapid response to animal disease outbreaks by Veterinary Services' national networks is crucial to ensuring global sanitary security.

ANIMAL PATHOGENS USED AS BIOWEAPONS

Throughout history the majority of pathogens that have been used as bioweapons or in bioweapons development have been animal pathogens, and especially pathogens with zoonotic potential.

Animal disease outbreaks can have considerable economic and social consequences because they impact directly on productivity, local economies and market access. The cost of controlling these diseases may also be very high.

Disease agents such as foot and mouth disease virus, the anthrax bacillus and African swine fever virus are readily available in endemic countries. They can easily be acquired from live or dead animals or from the environment and from laboratories (particularly those with lower levels of biosecurity). Advances in synthetic biology offer the possibility of further manipulating animal pathogens to make them more harmful than in their natural state. This situation, coupled with the fact that they can easily be smuggled across borders undetected, makes them very attractive to those wishing to cause disruption and economic losses in countries that are free from the disease.

Two very important factors need to be taken into account when securing and handling animal pathogens in a laboratory environment. These are:

Biosafety

Laboratory biosafety describes the containment principles, technologies, and practices that are implemented to prevent the unintentional exposure to biological agents and toxins, or their accidental release.

...and Biosecurity

Laboratory biosecurity describes the controls on biological materials within laboratories, in order to prevent their loss, theft, misuse, unauthorised access, or intentional unauthorised release.

Biosafety and biosecurity measures are a prerequisite for laboratories handling or storing pathogens. The OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* Chapters 1.1.3 and 1.1.3a (2014) provide a standard for biorisk management and guidelines on biosafety and bio-containment.

Rinderpest Eradication

Rinderpest was a devastating disease for centuries. Following carefully coordinated global efforts the world could finally be declared free from rinderpest by the OIE and the FAO in May 2011. This is only the second disease after smallpox in humans that has been successfully eradicated.

However stores of [rinderpest virus](#) remain in a number of laboratories and, like smallpox, there is the potential for accidental or intentional release unless these remaining viruses are destroyed or safely secured. This is why all OIE Member Countries have adopted three Resolutions demonstrating their international commitment to destroy any remaining stocks of rinderpest virus or safely secure them in a limited number of approved high containment facilities under FAO and the OIE's control.

EARLY DETECTION AND RAPID RESPONSE TO ANIMAL DISEASE OUTBREAKS

Whether animal disease outbreaks result from natural events or accidental or intentional release, the mechanisms for early disease detection, notification and control are very similar. To maintain global disease security these mechanisms must be in place in all countries.

[Effective Veterinary Services](#), complying with OIE standards on quality and capable of early detection and rapid response to any disease incursion, offer the best protection against any natural or intentional introduction of animal pathogens to animal and human populations.

When there is a suspicion that a malicious act is behind an animal disease outbreak, it is important to know about it at a very early stage so that the appropriate response mechanisms can be quickly implemented to avoid the exponential spread of these pathogens. Using modern techniques, laboratory experts in OIE Reference Laboratories will often be the first to confirm the identity and origin of a pathogen.

Animal producers and field veterinarians play a very important role in being the first to suspect a contagious disease in animals. Continuing education for producers and field veterinarians is essential to maintain their preparedness.



OIE BIOLOGICAL THREAT REDUCTION STRATEGY

The OIE works to ensure that national Veterinary Services throughout the world are effective in preventing and controlling animal diseases whatever their origin. The OIE provides global programmes designed to constantly improve world animal disease security.

1. Policies, advocacy and communication

The OIE strives to ensure that bio-threat reduction policies remain on the political and technical agenda, that they are sustainable and integrated into the existing animal health policy framework, and that they are communicated to relevant stakeholders.



The upcoming [Global Conference on Biological Threat Reduction](#) (30 June–2 July 2015) will put biological threat reduction on the agenda of policy makers (Agriculture, Defence, Environment) and Health and Veterinary Services in all OIE Member Countries. It will

help strengthen links between the health and security communities by engaging key partners in public health, animal health and the security sector. It will also promote human and animal health organisational frameworks as a key to reducing biological threats.

2. Maintaining expertise and setting standards, guidelines and recommendations

The OIE has access to world leading expertise in approximately 300 OIE Reference Centres. The OIE is building laboratory capacity in all regions of the world through the OIE [Laboratory Twinning Programme](#), allowing existing OIE Reference Centres to directly cooperate with candidates from in-transition and developing countries. To date, 20 twinning projects have been completed, 33 are ongoing and 5 of the twinning projects have resulted in the designation of new OIE Reference Centres in areas where expertise is needed.

The OIE *Terrestrial and Aquatic Animal Health Codes and Manuals* provide international standards, guidelines and recommendations on the prevention and control of agents that are pathogenic for animals, humans, or both.

The quality of [veterinary education](#) guarantees effective Veterinary Services and the development of a culture of responsible and benevolent science. The OIE is campaigning to improve the quality of veterinary education worldwide, including biological threat reduction capacities, and is taking action by setting guidance for future veterinarians on core competencies and core curricula which can be used as a benchmark by veterinary education establishments. To help individual establishments better comply with this benchmark, the OIE has recently extended the concept of Twinning to veterinary education establishments.

3. International cooperation

The OIE has signed official Agreements and continuously cooperates with international partners including the Biological Weapons Convention (BWC) and the UN Office for Disarmament Affairs (UNODA), the World Health Organization (WHO), the Food and Agriculture Organization (FAO), and the International Air Transport Association (IATA) on matters relating to biological threat reduction and biosafety.

How to prohibit the development, production and stockpiling of biological and toxin weapons, and ensure their destruction?

The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, commonly known as the Biological Weapons Convention (BWC), or Biological and Toxin Weapons Convention (BTWC), entered into force in 1975. It now counts over 160 States Parties.

Through the national implementation of its provisions, the BTWC helps to ensure modern biology is safe, secure and used solely for our collective benefit. No organisation has yet been given the responsibility to verify the compliance and obligations of signatory States to the BTWC. Within the framework of its overarching missions to safeguard of animal health, the OIE collaborates with the BTWC and manages a number of mechanisms able to help countries meet their obligations as required under the terms of the BTWC.

4. Global disease intelligence

The World Animal Health Information System ([WAHIS](#)) ensures transparency of the global animal disease situation. WAHIS alerts the international community to outbreaks of OIE-listed and new and emerging animal diseases so that an effective global response can be mounted. OIE Member Countries have a legal obligation to immediately report relevant events in terrestrial, aquatic and wild animals through WAHIS. For this purpose, 180 countries are connected to the OIE's central server. All information processed through WAHIS is available [online](#).

The effectiveness of the WAHIS system is also based on the capacity of each country to maintain operational networks for early detection and to comply with OIE standards for timely reporting.

5. Capacity-building and solidarity

The OIE evaluates the performance of national Veterinary Services through the OIE PVS Pathway (PVS: Performance of Veterinary Services). The aim is to assess the capacity of each country to comply with OIE standards on quality of the Veterinary Services, based on the evaluation of specific critical competencies including human, physical and financial resources; technical authority and capability; interaction with stakeholders and access to markets. Specific tools to evaluate national veterinary laboratory networks are now also available within the PVS Pathway framework. A majority of these standards are relevant for biological threat reduction activities.

For more information

- [Biological Threat Reduction: OIE webpage](#)
- [The OIE Biological Threat Reduction Strategy](#)
- [OIE Campaign for the sequestration and destruction of the rinderpest virus](#)