

Preface

Biological threat reduction

It has been 11 years since the World Organisation for Animal Health (OIE) published a *Scientific and Technical Review* on bioterrorism, which was entitled 'Biological disasters of animal origin: The role and preparedness of veterinary and public health services'. Highlights of this issue included an overview and history of biological agent use, details of the threats that were prevalent at the time, a description of the available capabilities/tools to respond to such a threat, and a summary of the requirements/recommendations for ensuring preparedness to address the changing landscape over the next 20 years.

Since the 2006 review, much in our world has changed. Although many of the same challenges related to biological agents remain, others have emerged. The world has experienced an increase in social unrest and war, and this has led to increased food insecurity and the displacement of entire populations of people from their homelands. We have witnessed an increase in the occurrence and severity of emerging pathogens (the Ebola virus outbreak in West Africa, 2014; the Zika virus outbreak in the Americas and Caribbean, 2015), an increase in antimicrobial resistance, and technological advances that have resulted in the ability to more easily produce a genetically engineered biological agent/weapon.

Other factors that play a role in our increasing vulnerability to a biological weapons attack were discussed in the 2006 issue of the *Review* but, since this time, have become even more pronounced. These include: the increased movement of people, animals, plants and products globally; the trend towards more specialised, intensive and concentrated farming practices in livestock production; and the ease by which biological agents can be obtained and used in an agro-terrorist and/or a bioterrorist event.

The OIE, by virtue of its mission, has always directly or indirectly supported efforts to reduce biological threats and has implemented a number of initiatives. Over the past decade, the OIE has worked to define and solidify its role in ensuring global health/food security. In 2012, it published its first strategy for Biological Threat Reduction (BTR). The strategy was updated in October of 2015, following the first OIE conference on BTR in the same year, and is aligned with the OIE's Sixth Strategic Plan. The OIE BTR strategy focuses on five key areas:

- Maintaining scientific expertise, and setting standards and guidelines
- Good governance, capacity-building and implementation of the 'One Health' concept
- Global disease intelligence and updates on the latest methods for disease prevention and control
- International cooperation and solidarity between countries
- Advocacy and communication.

It is through these five key areas that the OIE is working to improve preparedness for the natural or intentional introduction of a biological agent. The OIE maintains a robust network of scientific expertise in its Collaborating Centres, Reference Laboratories, and *Ad hoc* and Working Groups. These respected bodies provide expertise to support the development of science-based standards, guidelines, and policies for preparation and response to a biological event. In addition, they work to ensure that information about the latest vaccines, control

measures and diagnostics is disseminated to OIE Member Countries. The Performance of Veterinary Services (PVS) Tool and twinning programmes also work to support capacity-building, good governance, and the implementation of One Health programmes. Through the PVS and twinning programmes, Member Countries can work to identify gaps, enhance capacities and advocate for resources to strengthen their Veterinary Services. The One Health initiative is supported through joint planning and capacity-building with the public health sector of each Member Country. Disease intelligence and transparency of reporting take place through the OIE's World Animal Health Information System (WAHIS). Member Countries are required to report outbreaks of disease as well as new and emerging disease events in domestic animal and wildlife populations. With the recognition that 80% of biological agents are of animal origin, the timely reporting and monitoring of disease events is even more critical. As a result of this, and the OIE's network of scientific expertise, the OIE has a memorandum of understanding with the United Nations (UN) to provide expertise and support to UN investigations of alleged use of biological weapons.

Whether naturally or intentionally introduced, an emerging or zoonotic disease outbreak could lead to large numbers of human and animal deaths, economic devastation, and a large-scale disruption of the global food supply chain. With an expected 9 billion people to feed by the year 2050, it has never been more necessary for us to support technological advancements in production agriculture while, at the same time, working diligently to ensure that we are prepared for the introduction of a biological agent.

This issue of the *Review* is divided into the following sections:

- Defining the threat
- Surveillance and early detection of natural, deliberate or accidental biological introductions
- Responding to a biological threat
- International initiatives and frameworks to reduce biological threats
- Strengthening global biosecurity and resilience and ensuring sustainability.

Within these sections, the authors discuss the potential impacts of animal pathogens, including zoonotic agents, on economies, social unrest, food security and public health. They review the current frameworks for an international response to a biological event and explore UN mechanisms for the response to an alleged use of biological agents. In addition, in this issue, the technological advances for early detection, surveillance and response to a disease event are explored. The review concludes by discussing systems for strengthening global biosecurity and resilience and considering methods of ensuring the sustainability of these systems.

A review of BTR has never been more timely, and it is my hope that it will be of immense interest and value to both the global animal and human health communities. I wish to express my personal gratitude to all the authors who have contributed to this important review. In the same light, I would like to thank Dr Tammy Beckham for coordinating this review on behalf of the OIE and editing and reviewing the papers submitted. She is to be congratulated for leading this effort, which has resulted in this important publication on BTR.

Monique Éloit
Director General

