

EXPLORING INNOVATIVE APPROACHES TO IMPROVING SUSTAINABLE MANAGEMENT OF ANIMAL HEALTH EMERGENCIES



Paris, France, 26-27 November 2019

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Executive Summary

The OIE Workshop on “Approaches to Improving Sustainable Management of Animal Health Emergencies” was held at OIE Headquarters in Paris, France, on 26 and 27 November 2019. It was organised as part of the joint OIE-FAO-INTERPOL “Building Resilience against Agro-Terrorism and Agro-Crime” Project (hereafter referred to as “the Project”), which is funded by the Weapons Threat Reduction Program (WTRP) of Global Affairs Canada. The overall objective of this Project is to strengthen multisectoral capacity to respond to agro-terrorism and agro-crime by fostering cooperation at the regional and international level and building capacity through training and exercising. The Project focuses on emergencies which result from agro-terrorism or agro-crime, whilst aiming to build resilience against all types of animal health emergencies.

The purpose of this workshop was to share information about approaches which could improve the sustainability of emergency management, particularly in lower-resource settings. It also aimed to foster greater collaboration between the animal health and law enforcement communities. Workshop outputs would support a global conference on emergency management in 2021 and inform a future work programme.

The 53 participants that attended the workshop represented Veterinary Services, law enforcement authorities, academia, international and non-governmental organisations, and the private sector. Efforts were made to ensure that most regions were represented, and that gender balance was achieved.

Participants agreed that sustainability of emergency management was challenging to achieve in both low- and high-resource settings, and that innovative approaches could offer partial solutions. Innovative tools presented included: inter-country agreements to share human resources for emergency response; public-private partnerships; assessment and prediction models (including those using climate data and ‘big data’); resource mobilisation mechanisms; response networks (including research); and mechanisms to fast track development of pharmaceutical interventions, e.g. vaccines.

The experiences shared by presenters illustrated the diverse range of individuals and groups with a stake in emergency management, highlighting the importance of whole-of-society approaches.

The importance of multidisciplinary collaboration and cooperation was reflected in the results of a post-workshop survey, which showed that most participants left the workshop with ideas about working with colleagues in other sectors and with different expertise.

A number of ways of improving sustainability of emergency management were identified, including exploring novel ways of mobilising resources for response; using disease prediction models; encouraging groups of countries to cooperate and share resources for exercises and response; utilising science (including risk assessment) and technology to develop cost-effective strategies; and making smarter use of networks and coordination frameworks.

Feedback from participants was positive and praised the diverse range of presentations. In addition, the workshop acted as a launch meeting for the “Building Resilience” project, with many of those present either already involved with Project activities or interested in being part of the Project and following its progress.

It was clear that there is a need to raise awareness of the threats and consequences of agro-terrorism and agro-crime and that multisectoral preparedness should involve security and law enforcement sectors.

The OIE appreciated and acknowledged the support from Global Affairs Canada in funding the workshop.

Opening

Dr Matthew Stone, OIE Deputy Director General "International Standards and Science", welcomed the participants and highlighted the workshop objectives. The topic resonated with his own personal experience dealing with an agro-crime event in New Zealand (‘Operation Waiheke’).

Session 1: [Chaired by Dr Francesco Berlingieri, European Commission]

Global Context

1. Setting the scene – OIE’s review of national contingency plans. “The gulf between emergency plans and resources needed: A global review”

[Dr Keith Hamilton, OIE HQ]

In 2019, the OIE carried out a survey of global animal disease contingency plans (or emergency plans). The results showed that 163 of the OIE’s 181 Member Countries had some form of national contingency plan. However, there was evidence that many of these plans were not being fully implemented due to a lack of financial resources, legislation, and/or infrastructure. In terms of capacity to respond, regions with larger export markets appeared to have invested more in planning.

If National Veterinary Service emergency plans are not linked to national cross-government emergency plans, they may not be operational. Therefore, having an emergency plan per se does not mean that a country is prepared for an emergency. To be fit for purpose, plans need to be tailored to the specific country situation and account for resources. The survey results also showed that there was a tendency for ‘reactive’ planning, i.e. planning after events had become emergencies. This highlighted a need to consider systematic planning. Generic emergency plans could be a way to bolster preparedness for a range of threats, i.e. a range of diseases and/or different types of hazard.

2. Global review of linkages between Veterinary Services and national emergency management plans

[Ms Armaghan Nasim, Georgetown University Center for Global Science and Security, Virginia-Maryland College of Veterinary Medicine]

Ms Nasim presented a global review of linkages between Veterinary Services and national emergency management plans (NEMPs). The cumulative effects of population growth, rapid urbanisation, increasing globalisation and climate change mean that the importance of NEMPs for zoonotic and epizootic disease is ever increasing. The review assessed the level of inclusion of animal health in the NEMPs of 86 OIE Member Countries and the association with various factors, including geographical region, publication date of the NEMP, national income status, and the contribution of the agricultural sector to national gross domestic product (GDP).

Only one third of the NEMPs which were analysed expressly mentioned ‘Veterinary Services’, while approximately two-thirds mentioned ‘animals’ or ‘animal diseases’. The factor with the greatest correlation with the inclusion of animal health in NEMPs was the level of the agricultural sector’s contribution to the national GDP. Of the specific animal diseases mentioned in some NEMPs, none of the diseases, zoonotic or epizootic, were mentioned in conjunction with fisheries and/or aquaculture, despite the increasing use of aquaculture to meet the food demands of the growing world population. The lack of inclusion of Veterinary Services in NEMPs is problematic and highlights a lack of capacity to use them during and after an emergency event.

3. Cost–benefit analysis of investing in emergency preparedness

[Dr William Gilbert, University of Liverpool]

Dr Gilbert presented the interim results of an economic analysis of the benefits of investing in preparedness for animal health. The analysis was initiated as part of the first phase of the joint OIE-FAO-INTERPOL project “Building resilience against agro-terrorism and agro-crime. A summary of the potential economic impacts of an animal disease was provided, with a hypothesis that investing

in emergency preparedness of Veterinary Services reduces the direct losses of a disease outbreak and the cost of response. Dr Gilbert laid out the significant challenges to the analysis caused by the uncertain nature of an agroterrorism event and by the difficulties of quantifying historic investments. Methods for dealing with these obstacles were then discussed. Focusing on four geographic regions: East and West Africa, the Middle East and South East Asia, data collected through the OIE's PVS programme were examined. The relationships established between available data allowed the interpolation of national Veterinary Service and emergency preparation spending estimates across gaps in the data, and further analyses at regional level to be performed.

Discussion

The opening session set the scene by describing some important high-level gaps in emergency management capacity. Emergency management strategies and approaches, and the benefits gained from investing in preparedness, vary according to the national situation. Investments in planning appear to be prioritised according to resources available and perception of risk. The session also highlighted the link between overall revenue from agriculture and willingness to engage in contingency planning for animal health.

Having a contingency plan does not mean that a country is ready to apply it, and many countries do not have the necessary resources, legislation, or capacity to implement the plans effectively. The discussion also emphasised the need to include intentional spread of animal diseases and accidental laboratory release in contingency plans.

More work could determine how many emergency plans have been tested through a simulation exercise and/or by a real emergency and explore the extent to which risk assessments have informed emergency planning.

Resource mobilisation for emergency response

1. The importance for resource mobilisation of linking animal health emergency response to whole-of-government frameworks

[Dr Odireleng Idy Thololwane, Department of Veterinary Services, Botswana]

Dr Tholowane presented Botswana's government model for mobilising resources for Veterinary Services during animal health emergencies. He emphasised the need for good linkages between Veterinary Services and central government frameworks, as strong links ensure timely resource mobilisation in the event of animal or veterinary public health emergencies and enable Veterinary Services to adequately execute their mandate. A timely and effective response is best achieved through provision of adequate and prompt funding, good coordination, stakeholder engagement and collaboration; all these must be supported by robust legal frameworks and policies.

2. Solidarity Funds: *Fonds national agricole mutualisation du risque sanitaire et environnemental (FMSE)* – A mutual fund for health and environmental risks in agriculture in France

[Ms Marie Jousse, FMSE]

FMSE is a mutual fund created in 2013 to support response to adverse animal health and environmental events in the agriculture sector in France. Its mission is to compensate farmers for losses which result from environmental accidents due to pollution or from animal diseases listed by a 2013 French ministerial order (most of which are on the OIE list of notifiable diseases and in appendix I of Council Decision 2009/470/EC on expenditure in the veterinary field). The operation of the fund follows a European Commission regulation (within the Common Agricultural Policy [CAP]) which allows for a proportion of the compensation expenses to be refunded by the State or the European Union.

Costs and losses eligible for compensation by the fund include 1) costs and losses due to the disease, such as animal deaths and yield losses and 2) losses due to disease control measures (except mandatory slaughter), which include isolation costs, yield losses, commercial losses due to inability to sell, and costs associated with disease treatments. For the national compensation programme, 65% of expenses come from the State and 35% come from FMSE. Of the expenses covered by FMSE, 30% come from a communal section of the fund, which receives contributions from all farmers, and 70% come from one or more specialised sections (e.g. ruminant section, swine section).

FMSE is a risk management tool which can contribute to the efficiency of disease eradication plans and the protection of agricultural produce.

A number of examples of the way in which FMSE is used were presented. These included an example of its use in the context of disease surveillance programmes (bovine tuberculosis, brucellosis and enzootic bovine leukosis), where farmers are compensated for isolation costs that result from positive test results or suspicions of disease. This encourages early notification and minimises economic losses.

3. Insurance/reinsurance – does it have a role?

[Mr Gary Hutchings, DH AgRisk]

“An ounce of prevention is worth a pound of cure.”¹ Insurance and reinsurance models can play a role in mobilising resources to support the response to animal health emergencies; they can also play a role in incentivising stakeholders to take preventative measures. To create insurance solutions against highly infectious diseases there is a need to fully understand how the disease can circulate within an animal population and what systems or processes can be utilised to mitigate the spread. This knowledge may, in turn, be used to develop a defence against an animal health emergency or respond to one effectively, should one occur. Insurance is not just about transferring risk but understanding it. The risk of infectious disease entering a farm can be greatly reduced at farm level. Individual farmers can play a significant role in reducing risks (thus protecting their business) by applying biosecurity measures. The adjustment of insurance premiums based on risk and actions that policy holders take to reduce that risk allows farmers to be rewarded for applying biosecurity measures.

4. Public-private partnerships – an example from Namibia

[Dr Anja Boshoff-De Witt, Namibia Meat Board]

A good case study of an effective public-private partnership (PPP) is the emergency animal health fund for foot and mouth disease in Namibia. This partnership is between the public-sector Directorate of Veterinary Services (DVS) and the private-sector Meat Board of Namibia (MBN). The MBN initiated the establishment and funding of the emergency animal health fund to assist the DVS to set up disease control measures immediately in the event of an emergency. In addition, the Animal Health Consultative Forum was established as a platform for regular interaction between the two sectors, even in times outside of emergency situations. Other countries can benefit from this example of a PPP, whereby a fund established by the private sector can be mobilised in times of emergency to protect private-sector interests through supporting the Competent Authority, thus creating a win-win situation for both partners.

Discussion

Though animal health emergencies are taken seriously by all countries, some countries with lower-capacity Veterinary Services have difficulties sustaining investments in prevention; this is compounded by poor coverage of Veterinary Services in remote areas. This has led some countries to put in place surveillance systems managed by farmers with support from stakeholders.

It is important for all stakeholders (including livestock producers) to take responsibility for, advocate for, and invest in preventative measures, including vaccination and biosecurity. Non-adherence to vaccination programmes and other control programmes may lead to farmers not being compensated, as described in the presentations on solidarity funds and the insurance/reinsurance model, or to high insurance premiums.

A challenge for Veterinary Services is the compensation policy for animals culled because of government control programmes. The problems include no policy being in place at all, funds not being sufficient to cover the value of the animal(s) destroyed, and funds not covering costs from loss of business or loss of ability to resume production.

The benefits of PPP models demonstrate that they offer a sustainable approach to improve Veterinary Services' emergency management. It was highlighted that PPPs work well when driven by the livestock industry. They provide mutual benefits for both the public and private sector, such as emergency funding and resources, thus facilitating a more efficient and effective emergency response.

¹ Benjamin Franklin - February 4, 1735

Solidarity funds, and insurance/reinsurance models do have potential to work in lower-resource settings when their advantages are promoted amongst the farming communities. Insurance/reinsurance models rely on farmers being responsible for reducing the risk of disease entry onto their farm through effective biosecurity practices. To incentivise farmers to take up insurance/reinsurance, it is also important to support the market/maintain market continuity for livestock and livestock products during an outbreak.

A mix of these models and approaches, considering the local context, could be supported to improve emergency management.

Session 3: [Chaired by Dr Gail Carson, GOARN Vice-Chair]

International Cooperation for Animal Health Emergencies

1. History and guiding principles of the International Animal Health Emergency Reserve (IAHER) and guidance for other countries considering an IAHER-style approach

[Ms Sharon Kolek, Australian Government Department of Agriculture]

The International Animal Health Emergency Reserve (IAHER) is a non-binding international cooperation arrangement to voluntarily share personnel between countries in the event of an animal disease emergency to supplement domestic emergency response capabilities. The signatory countries are Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States of America. There is no funding obligation for countries donating personnel, and the recipient country covers all the expenses incurred except salaries, which are covered by the donating country. The IAHER has an operations manual that includes: standard operating procedures; processes for activation and deployment (including insurance, travel, security, recognition of qualifications); roles and responsibilities; and financial arrangements. Having this manual prepared in peacetime means that personnel can be deployed rapidly in the event of an emergency.

A key consideration for other groups of countries wishing to develop an IAHER-style model is that the arrangement should be between similar partners (alignment of legislation, similar incident command systems, mutual recognition of qualifications, etc.) with strong relationships already in place. In addition, there should be a commonality of language and the signatories should have the commitment and the capacity to implement the arrangement.

2. Testing IAHER – simulation

[Dr Gordon Cleveland, USDA APHIS VS OSIC]

The IAHER has been tested through a functional simulation exercise, Exercise Athena. This exercise aimed to raise awareness about the IAHER Arrangement and to test the IAHER Operations Manual. It was an opportunity for all signatory countries to practise their role, with Australia as the recipient and the other countries as donors, in the mobilisation of personnel to meet a surge in demand. There were no field activities nor any actual deployment of personnel. The exercise met its aim and objectives, continued to build on communication and collaboration between the signatory countries, and identified lessons to further strengthen and maximise the value of the arrangement.

3. Testing IAHER – real example

[Ms Sharon Kolek, Australian Government Department of Agriculture and Dr Andre van Halderen, New Zealand Ministry for Primary Industries]

On behalf of Dr Andre van Halderen from the New Zealand Ministry for Primary Industries, Ms Kolek described a real example of bilateral activation of the IAHER by Australia and New Zealand for New Zealand's national *Mycoplasma bovis* eradication programme.

The experience emphasised the importance of having the Operational Manual prepared in peacetime, with clear expectations of capabilities agreed in advance. The value of sharing a common language, especially for technical farming and veterinary terms, was clear. Educational requirements for the veterinarians in the two countries are similar, meaning that the veterinary qualification was recognised and mutual registration was easy. Similarly, transferring laboratory personnel from Australia was straightforward, as their skills and qualifications are considered equivalent to those of staff in New Zealand. The IAHER activation was supported by a dedicated logistics team that could deal with travel, accommodation, and IT needs. The rapid response from Australia to the specific needs of New Zealand was praised.

The challenges with the arrangement included the problem of ensuring that the recipient country had an effective induction programme for incoming staff from the donor country. In an emergency response, implementing an induction programme is not always easy, but it is vital to ensuring that staff can operate as effectively as possible. An additional challenge was the short duration of the deployment of staff. Most of the personnel were deployed for only 2–3 weeks, and it was felt that they would return just when they were getting to grips with their role; this was less of an issue for laboratory staff, as testing protocols are standardised. A minimum deployment of 6 weeks would have been more useful, but this is not always possible, as there may be constraints on the ability of the donor country to spare staff and staff may be unavailable due to family commitments. Defining the specific needs of the recipient country and conveying these to the donor country can also be challenging, and it is often difficult in practice to know exactly what is needed (e.g. skills and numbers of staff).

In summary, the assistance provided by Australia was invaluable and New Zealand was grateful for the help provided.

4. Similarities and differences between international mechanisms to support public health emergencies and animal health emergencies, and the reasons for the differences

[Dr Ludovic Plee, FAO and Dr Patrick Drury, WHO]

Representatives from the FAO Emergency Management Center - Animal Health (EMC-AH) and the Global Outbreak Alert and Response Network (GOARN) presented the emergency management systems and coordination mechanisms in place at FAO and WHO, respectively.

Despite the different mandates of the FAO and WHO in addressing preparedness and response to threats, a similar approach is being used in terms of global coordination of events of international concern and both systems are widely interlinked in order to address needs under the One Health approach. Mission deployment information and needs for expertise are also widely shared between the two emergency entities on a regular basis.

Discussion

Mechanisms for mobilising and sharing personnel during health emergencies can play a valuable role in sustainable emergency management and can help meet the demand. Challenges may be encountered if the emergency extends to several countries or regions.

The IAHER model could be replicated in other parts of the world, such as in the Americas (between Spanish-speaking countries). Although there are challenges in ensuring commonality of language between countries in some regions, there are solutions, including use of a common second language or local translators.

Another model for resource sharing in response to public health emergencies is the GOARN model, which facilitates the deployment of experts from over 250 partner technical institutions and networks (including national governments, research networks, and individual research institutions) in response to requests for assistance from WHO Member Countries. Recent attacks on healthcare workers involved in the Ebola response in the Democratic Republic of Congo (DRC) highlight the importance for any arrangement to prioritise the care of its deployed workers, ensuring that the necessary security, health, and wellbeing support is available. In such circumstances, a strong relationship with law enforcement and peacekeepers is essential to support emergency workers.

Communication at the community level is essential to develop trust and support for response actions. This requires a multisectoral approach that engages a wide variety of partners and stakeholders, including law enforcement, to support this dialogue. High-level political support is also essential.

Session 4: [Chaired by Dr Osman Dar, Chatham House]

One Health networks and timely delivery of interventions through research and development

1. Rift Valley fever – the challenges of sustaining preparedness against a periodic emergency

[Baptiste Dungu, Onderstepoort Biological Products SOC Ltd]

Dr Dungu's presentation emphasised the need to maintain emergency management capacities during interepidemic periods, particularly for diseases such as Rift Valley fever, which occurs periodically. Because larger outbreaks of RVF only occur on average every 5–10 years it can be difficult to incentivise livestock owners and governments to maintain capacity for emergency response or to implement preventative measures (such as vaccination) during extended interepidemic periods. To maintain preparedness for RVF and ensure that prevention measures are cost effective, risk-based strategies could be adopted, e.g. seasonally and geographically targeted vaccination and health promotion programmes. Vaccine banks for RVF could also support preparedness. Dr Dungu highlighted the growing capacity of African pharmaceutical companies to manufacture and distribute quality-assured vaccines (including RVF vaccine) for use on the continent – highlighting the importance of self-sufficiency and sustainability in improving disease control.

2. High-containment laboratory preparedness – opportunities for rapid laboratory response against emerging and existing zoonotic pathogens: leveraging capacity through global alliance

[Dr Bradley Pickering, CFIA]

In 2011, the Canadian Food Inspection Agency (CFIA) demonstrated that swine were susceptible to Ebola virus infection. In the wake of the West Africa Ebola virus outbreak, the CFIA increased its diagnostic capacity to test swine, and demonstrated that they were a potential amplifying host for Ebola virus. Following this work in 2016, it was realised that there was a need for an integrated One Health government biosafety level 4 (BSL4) network. This resulted in the establishment of the Biosafety Level 4 Zoonotic Laboratory Network (BSL4ZNet), which coordinates activities across 15 partner organisations in the UK, USA, Canada, Australia, and Germany. The Network has grown significantly since its inception and continues to maintain its mission, which is to sustain trusted BSL4 partnerships to strengthen international coordination, improve knowledge sharing and leverage capacity for diagnostics, research, and training. The Network also has plans for a pilot tabletop exercise to assess response capacity and communications in the event of a zoonotic level 4 pathogen outbreak.

3. An R&D Blueprint for action to prevent epidemics

[Dr Marie-Pierre Preziosi, WHO]

Dr Marie-Pierre Preziosi presented on the prioritisation, coordination and fast-tracking of research and development through the WHO's R&D Blueprint. This mechanism aims to ensure that effective and appropriate medical interventions are available at the earliest opportunity (avoiding undue regulatory delays) for use in the event of an infectious disease emergency. The Blueprint is focused on selected priority diseases (including 'Disease X') – which have been selected because there is a need to address current gaps – and the team has worked to map and coordinate stakeholders involved in the research and development of related diagnostics, vaccines and treatments for each disease. Steady progress has been made against the various milestones of research preparedness.

Tools, documents and research priorities generated as part of research preparedness and response activities have been critical in shaping, accelerating, and supporting research during outbreaks. Some support has been provided to countries to enable them to consider ethical issues for research (e.g. informed consent) and to develop national research plans. More work is needed on the sharing of commercial benefits of R&D (with the countries where outbreaks are occurring). This may have some implications for sustainability of R&D capacity-building efforts.

4. Rapid scale-up of vaccine development

[Dr Mike Whelan, CEPI]

The Coalition for Epidemic Preparedness Innovations (CEPI) is a global coalition of public, private, philanthropic, and civil society organisations which aims to stimulate, finance and coordinate vaccine development for emerging infectious diseases. Its goal is to reduce the global risk of epidemics by developing vaccines to control outbreaks. CEPI's vision is a world in which epidemics are no longer a threat to humanity. CEPI works across preparedness, response, and sustainability. The CEPI portfolio includes MERS-CoV, Lassa fever, Nipah virus infection, Disease X, Rift Valley fever, and Chikungunya. Work includes advancing the most promising 'vaccine candidates' for priority diseases (PREPARE) and validating novel 'platforms' for emergency response (RESPOND). The objective is to reduce the time from development, through trials, to use in the field by doing as much work as possible before the next big event. Several of the novel platforms are looking promising. The portfolio and work of CEPI closely align with WHO's R&D Blueprint. Achievements to date include accelerating the development of prophylactic vaccines and of responsive vaccine platforms. Vaccines will be available on an equitable basis for those that need them regardless of their ability to pay.

5. Vaccine reserves – assured emergency supply options (AESOP)

[Dr Keith Sumption, EuFMD]

Dr Keith Sumption presented on vaccine reserves and assured emergency supply options and shared the work of the European Commission for the Control of Foot-and-Mouth Disease (EuFMD) in this area. He highlighted the importance of maintaining strategic reserves of antigens and vaccine and the relative merits of national stockpiles, virtual vaccine banks and assured stock options (e.g. AESOP). Challenges related to rapidly evolving risks, multiple risks (antigens) and high costs were discussed. Models such as AESOP may be able to address some of these challenges by spreading risks across countries, lowering costs and possibly increasing access for countries not able to afford their own stockpiles; however, some easing of regulations around the use of vaccines from other regions may be required.

6. International mechanisms to facilitate animal health research and development in response to emergencies – current situation

[Dr Alex Morrow, STAR-IDAZ]

Poorly controlled outbreaks of porcine epidemic diarrhoea (PED), in North America, and African swine fever (ASF), globally, have highlighted the inability of current tools to support rapid, effective response. The length of time from vaccine development to delivery is widely seen as being too slow. New technology platforms offer the hope of shortening the innovation pathway and approval process so that vaccines are available more rapidly for emergent pathogens. Much could also be achieved by focusing the available resources on agreed critical gaps in knowledge. Dr Morrow presented on the work of the STAR-IDAZ International Research Consortium, a global initiative to coordinate research programmes at international level to contribute to the development of new and improved animal health strategies for at least 30 priority diseases/infections/issues. STAR-IDAZ includes research institutes, international and regional animal health organisations, national governments, funders of research, and manufacturers of veterinary medicinal products. The target

deliverables include candidate vaccines, diagnostics, therapeutics, procedures, and key scientific information/tools to support risk analysis and disease control. To achieve these goals, the partners agree to coordinate/align their research programmes to address identified research needs relating to the various topics and to share results. Dr Morrow emphasised that a key principle of the Consortium is to ensure the wide dissemination and sharing of research results without jeopardising intellectual property rights. STAR-IDAZ employs a multidisciplinary 'research roadmap' approach and adopts new approaches to vaccine development, including platform technologies such as vectored vaccines, virus-like particles, and self-amplifying RNA technology.

Discussion

To prevent RVF epidemics it is important to encourage timely livestock vaccination strategies (before outbreaks and not in the face of them). The timing and location of vaccine campaigns can be informed by risk assessment and prediction models, which are becoming increasingly accurate. Long interepidemic periods between RVF outbreaks mean that it could be difficult to persuade farmers to invest time and resources in preventative vaccination or to prioritise RVF vaccination over other more frequently occurring diseases. The use of multivalent vaccines (including RVF with other common livestock diseases) could encourage uptake of RVF vaccination. The need for an integrated One Health approach to RVF was highlighted by the inclusion of RVF in WHO's R&D Blueprint Roadmap.

Participants also highlighted that CEPI, on the human side, and STAR-IDAZ, on the animal side, could learn from each other and benefit from sharing experiences.

Self-sufficiency has a role to play in sustainability. For example, RVF is a regional problem for Africa and capacity for vaccine manufacture should be established in Africa. Likewise, diagnostic samples collected from the African continent should be used in research and vaccine development on the continent.

Session 5: [Chaired by Dr Melissa Berquist, IIAD]

Planning and exercising for emergencies, including deliberate-release scenarios

1. OIE Guidelines on Animal Health and Welfare Simulation Exercises

[Dr Daniel Donachie, OIE]

The OIE Guidelines on Animal Health and Welfare Simulation Exercises, developed by the OIE *ad hoc* Group on Veterinary Emergencies, outline the key principles to be considered in preparing, delivering and learning from a simulation exercise. The Guidelines emphasise the benefits of regular simulation exercises (especially those that involve working with other agencies and stakeholders), outline the different types of exercise, and provide practical guidance on how to plan and run an exercise. The guidelines consider scalability to resources available and recommend that complicated exercises, such as functional and full-scale exercises, should not be attempted before completion of the less-complicated exercises, such as drills and tabletops. Exercises are part of the continuous improvement cycle for emergency preparedness and should be conducted regularly, with any identified issues receiving appropriate action and mitigation to ensure Veterinary Services learn from lessons identified.

2. Nordic-Baltic Veterinary Contingency Group – a regional simulation exercise approach

[Dr Thomas Svensson, NBVCG]

The Nordic-Baltic Veterinary Contingency Group (NBVCG) is a Nordic-wide Working Group for Microbiology & Animal Health and Welfare that has been active since 2006. The primary objective is to improve cooperation, communication, and exchange of information and experiences between the Veterinary Authorities within the Nordic-Baltic region, in the context of contingency planning and during animal disease emergencies. Dr Svensson presented the Group's work on implementing two regional simulation exercises, Exercise Pegasus and Exercise Ruta. He highlighted that the design of regional exercises must ensure that all countries can engage and participate and be able to learn from each other. This pooling of resources for a regional exercise can allow smaller countries to have their voices heard and to play an active role in emergency preparedness activities. He closed by emphasising the need for a well-planned and detailed evaluation to identify issues and corrective action to be able to update contingency plans.

3. Ensuring cost effectiveness – the CELULEX exercise

[Major Júlio Gouveia Carvalho – Portuguese Army]

Major Carvalho presented the full-scale, multisectoral simulation exercise that takes place in Portugal every year. The "CELULEX" Exercise, which has been carried out for the last eight years, is organised by the Portuguese army to prepare its response to chemical, biological, radiological and nuclear incidents in a civil emergency environment, with a focus on civil-military cooperation. The participants include key stakeholders such as civil defence organisations, security forces, the fire brigade, and other public organisations with protection and relief responsibilities. International organisations, such as WHO, OIE, and the UN Office for Disarmament Affairs (UNODA), also attend as observers and/or participants, where relevant.

Drawing on a decade of experience in national and international exercises, Major Carvalho described the planning, implementation and evaluation of an exercise and highlighted good practices, which include ensuring cost effectiveness. Lastly, he emphasised that multisectoral exercises are an opportunity to be creative. In summary, he said that they should

- have achievable objectives;
- keep the planning as simple as possible;
- build partnerships and trust between different sectors.

4. 'GET Prepared' – a framework for better planning and testing of emergency preparedness

[Dr Sally Gaynor, EuFMD]

EuFMD is developing a toolbox of resources for assessing and addressing gaps in emergency preparedness – called 'GET Prepared'. This toolbox will be composed of existing and new tools developed by EuFMD and additional examples of good practices identified in collaboration with EuFMD Members and with DG SANTE Unit F2 of the European Commission. Whilst existing tools are for foot and mouth disease, many of the new tools will be able to be adapted for other Transboundary Animal Diseases (TADS), and others will be generic tools suitable for all TADs. EuFMD will continue its work on simulation exercises, based on needs identified by the 39 Members Countries (these include European Member States and countries on the borders of Europe that are not disease free or are at risk of the disease). EuFMD's work on building capacity for simulation exercises includes workshops, assistance with exercises, and the development of an on-line course EuFMD aims to have the toolbox available on-line by October 2021.

Discussion

Simulation exercises are a core component of emergency preparedness, yet many Veterinary Services have limited experience with them. Participants agreed on the usefulness of the OIE's high-level guidance for simulation exercises, which emphasise the importance of scalability (to available resources and expertise) and of multisectoral collaboration, using an all-hazards approach. Exercises play an important role in building and sustaining capacity by identifying gaps, which leads to lessons being identified and corrective action being taken to improve capabilities through a cycle of continuous improvement. Because learning from exercises and real events is so important, after-action reviews are essential.

A monitoring and evaluation framework is important for sustainable emergency preparedness and response. To support this, exercises should have clearly defined objectives linked to measurable indicators of performance. Exercises provide an opportunity to discuss and define indicators to assess and measure the impact of preparedness and response actions.

Having a contingency plan in place does not necessarily equate to 'preparedness', particularly if the plan is untested, so exercises should be incorporated as part of the contingency planning cycle.

A successful exercise should identify gaps and weaknesses (which are then addressed). The identification of gaps and weaknesses should be communicated as a positive thing; no one benefits from a "perfectly successful" exercise.

To be fit for purpose, plans must be tested within the local context and account for regional risks. Sharing contingency plans and exercise reports provides an opportunity for countries to learn from one another. Transparent and honest publishing of exercise reports also provides confidence to trading partners that a country takes preparedness and response seriously and helps to build trust. The inclusion of observers at an exercise also supports capacity building, whilst strengthening international solidarity and relations.

It was emphasised that countries could adopt a progressive approach to increasing the complexity and scope of exercises. For example, those with limited experience could start off with simple exercises and gradually build complexity into subsequent exercises as they gain experience.

Session 6: [Chaired by Mr Adrien Sivignon, INTERPOL]

Investigating and responding to agro-crime

1. Project RHINO – including veterinarians in the response to bioterrorism

[Dr Fanny Ewann, INTERPOL]

Project RHINO (Response capability, Hazard assessment, Infection control, National coordination, and Organisation change) is an initiative implemented by INTERPOL which aims to increase multi-agency preparedness to biological incidents. The project has identified challenges for engaging law enforcement and Veterinary Services in the health response; these include a lack of trust, the lack of common terminology, misunderstandings about roles and responsibilities, and inadequate resources. In the case of an animal disease outbreak, under normal circumstances the Veterinary Services should take the lead for investigation and response; however, if intentional release is suspected then law enforcement authorities should take the lead.

Every response is different, and roles and responsibilities of agencies should be agreed as much as possible during 'peacetime'. It can be useful to document *modus operandi* for inter-agency cooperation, e.g. in memoranda of understanding that clearly define the roles and responsibilities of each agency during an emergency and describe mechanisms for stakeholder and multi-agency engagement and coordination during the emergency.

2. Misinformation and criminal activity – recent experience with ASF outbreaks

[Dr Ashish Sutar, OIE]

ASF outbreaks in Southeast Asia are having a cascading impact along pig and pig-products value chains in the region. The outbreaks have impacted supply, leading to record high prices for pork in the region. As well as having damaging impacts on the economy and livelihoods, the situation is creating opportunities for criminals (including organised crime) and leading to the dissemination of misinformation; often the two go hand in hand. Examples of criminal activities include the selling of fake vaccines; threats of, or actual, intentional introduction of ASF to pig farms; unauthorised testing of experimental vaccines; and falsified certification (e.g. fake quarantine certificates). Misinformation linked to crime includes false claims about the effectiveness of therapeutics such as probiotics; rumours about ASF outbreaks, which are spread intentionally to increase pork prices; and claims that ASF is zoonotic. The abundance of rumours and misinformation highlights the importance of effective risk communication. Another recent example of crime affecting the animal health sector is the false certification of (sub-standard) FMD vaccines in East Africa.

To tackle criminal activity, it is important to understand the drivers of crime during animal disease outbreaks, i.e. the trends, the incentives, and behavioural indicators/patterns. Socio-economic research may be needed to analyse and better understand these drivers. Timely multisectoral action is needed to effectively identify, manage, and respond to both misinformation and criminal activity. To be effective, the different sectors need to know their roles and responsibilities in assessing, identifying, and acting on criminal activity and misinformation. Veterinary Services and law enforcement authorities must work closely together. Legislation is also needed to ensure that perpetrators can be prosecuted. To manage misinformation, in addition to effective proactive risk communication, there needs to be a systematic process for scanning information, evaluating it, verifying it as true or false, and taking action if it is found to be false.

3. USDA-FBI model for preparedness training

[Dr Stephen Goldsmith, FBI]

Following the 2001 anthrax incident in the United States ('Amerithrax'), the Federal Bureau of Investigation (FBI) and Centers for Disease Control and Prevention (CDC) launched the Joint Criminal and Epidemiologic Investigations Model. This evolved to include agro-crimes, and the United States Department of Agriculture (USDA) and the FBI developed a course to jointly train veterinarians and law enforcement officials in the investigation of and response to suspected agro-crimes (including espionage, insider threat, bio-terrorism and agroterrorism). Economic espionage, insider threats and commercial competition tend to be the crimes most observed. The course aims to share knowledge across public health, animal health and law enforcement communities. It provides common response protocols (and templates), including protocols for threat assessment, triggers ('tripwires') for initiating an investigation, joint information sharing, and interviews.

Challenges to joint investigation include: other animal health and law enforcement investigations going on at the same time; different cultures, procedures, ways of working, and reporting responsibilities across the two sectors; Veterinary Services hesitating to notify law enforcement authorities of a suspicion (i.e. concerned it may not be significant); and the lack of a unified incident command system for joint investigation.

To ensure early detection of deliberate events it is important to have systematic surveillance for unusual events. This involves monitoring the expected background level of endemic events; anything unusual or unexpected should be investigated. Although natural events are much more likely, investigations should aim to rule out accidents or deliberate releases.

4. Intelligence gathering and analysis for deliberate biological incidents involving animals (agro-crime and agro-terror)

[Dr Fanny Ewann, INTERPOL]

INTERPOL's Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) programme supports its Member Countries by gathering and analysing intelligence and sharing information on deliberate incidents involving biological materials. It also supports Member Countries with capacity building and training and provides operational support for investigation and response. The challenges of intelligence gathering and information sharing in the context of animal diseases include:

- The current absence of a platform monitoring global intentional events and a reporting system allowing the flagging of such events
- The small proportion of intentional events compared to the vast number of disease outbreaks (the needle in a haystack), creating challenges for open-source monitoring
- The scarcity of reporting of intentional events involving animal pathogens, mostly linked to the lack of awareness from Veterinary Services (resulting in events not being reported or investigated as suspicious)
- The lack, in many countries, of strong cooperation between law enforcement and Veterinary Services, and the absence of formal information sharing systems and/or agreement between the two sectors

Dr Ewann presented the ongoing project of building an INTERPOL Biological Incident Analysis Platform. Fed by several sources of information, it will include animal health disease data and should support national law enforcement agencies to anticipate biological threats. Analytical reports on trends and biological agents of concern will also be generated on the basis of the data extracted from this platform.

5. Investigation of suspicious outbreaks – OIE guidelines and intersectoral cooperation

[Dr Christine Uhlenhaut, OIE]

The OIE's [Guidelines](#) on Investigation of Suspicious Biological Events focus on the difference between standard epidemiological or clinical outbreak investigations and investigations of suspicious outbreaks that require inclusion of other sectors, i.e. law enforcement and forensic investigations. The organisational section of the guidelines addresses the need for multisectoral cooperation, listing many non-traditional stakeholders, and describes the resources, facilities and legal framework required. The operational section focuses on the phases of response planning and provides a list of 'triggers' that could indicate a deliberate event; these include epidemiological triggers (e.g. cases of an eradicated disease), laboratory triggers (e.g. missing high-consequence pathogens) and law enforcement triggers (e.g. online chatter pertaining to a biothreat). An intersectoral workshop, held in 2018 with participants from 14 countries, tested the guidelines against several scenarios. One outcome of the intersectoral workshop was a roadmap for the implementation of the guidelines.

Discussion

Both Veterinary Services and law enforcement authorities are involved in the investigation of and response to agro-crime. It is therefore important to encourage and foster cooperation between both sectors and to raise awareness about agro-crime and agro-terrorism. It is important to build trust across both sectors so that confidential information to support investigation or response can be easily shared. Approaches to fostering collaboration could include harmonising terminology between the two sectors, involving law enforcement authorities in the drafting of animal health national contingency plans, and joint participation in regular threat assessments and simulation exercises. Developing memoranda of understanding and granting security clearance to Veterinary Services could also support information sharing between the two sectors.

The tools and handouts described in the presentations can be obtained by contacting the speakers and, in the case of INTERPOL, by contacting the INTERPOL National Central Bureaus.

Session 7: [Chaired by Dr Paolo Dalla Villa, IZSAM]

Applied information systems and technology

1. Potential use of risk assessment to inform targeted surveillance for ASF at airports

[Dr Lina Mur, OIE]

Risk assessment can help to target surveillance activities and is an approach that can be applicable and useful in low-resource settings. Existing data sources and new methodologies (for example, machine learning methods and interconnection of databases) allow faster and better-quality assessments.

Illegal smuggling and transport of animal products is a demonstrated pathway for the spread of transboundary animal diseases around the world; it is especially important for ASF because of the high resistance of the virus in infected products. Dr Mur developed a quantitative stochastic risk assessment to estimate, using a binominal distribution, the risk of ASF introduction into the USA by illegal swine products carried by air passengers. The two main components of the model estimated: i) the volume (Kg) of swine products introduced into the USA by air passenger luggage, and ii) the probability of swine products being infected with ASF in their country of origin. The results meant that it was possible to identify the countries of origin, airports, and months that presented a higher risk for the introduction of infected products. Without targeting of activities and resources, controlling this route can be very difficult due to numerous limitations (personnel, resources, low sensitivity of detection, time for controls, etc.).

2. Bluedot

[Mr Matthew German, Bluedot]

Mr German presented the role of technology in managing surge events and shared the work of Bluedot in this field. Growing population density, increasing global interconnectivity, and the high volume of outbreaks around the world has led to near constant strain on global public health services. While major corporations use technology to scale operations, governments can leverage automation and artificial intelligence to relieve strained public health systems. Mr German highlighted the fact that, by carefully integrating technology into public health processes, we can increase the efficiency of reporting while providing novel insights into data to help drive decision-making.

3. READY: Global readiness for major disease outbreak response

[Ms Elburg van Boetzelaer, Save the Children]

READY is a consortium involving Save the Children US & UK, Johns Hopkins University (Center for Humanitarian Health & Center for Communications), UK-Med, Mercy Malaysia and EcoHealth Alliance. The consortium was formed following the West African Ebola virus epidemic, recognising the need for clear coordination between intergovernmental and non-governmental organisations. The overall objective of the 3-year project, which is funded by USAID's Office for Disaster Assistance (OFDA), is to augment coordination, operations, and technical capacity for outbreak preparedness and response. More specifically, to:

- (1) improve NGO coordination with critical infectious disease platforms to promote an effective and integrated multisectoral approach to major disease outbreak response
- (2) strengthen the operational capacity of organisations for a more efficient, integrated humanitarian response to major disease outbreaks

- (3) adapt and develop technical readiness across relevant sectors for an integrated response to major disease outbreaks.

READY aims to ensure that gaps in emergency response and organisations are understood and that targeted preparedness activities take place to address those gaps. Tools and technical guidelines will also be identified or developed to respond to identified gaps and made accessible through a knowledge management platform. To strengthen surge capacity, READY aims to identify personnel gaps and recruit to a roster, develop core competencies of outbreak response roles, align recruitment and deployment decision-making processes and strengthen the capability of outbreak response teams.

4. Rift Valley fever – risk mapping and prediction

[Dr Assaf Anyamba, NASA]

NASA's Rift Valley fever (RVF) model (RVF Monitor) is an early warning system for predicting the risk of RVF incursion using climate data and land surface ecological dynamics. Improvements have been made over the last 20 years in early warning systems, even though uptake of early warning information and action following early warning is still lagging far behind where it should be. Extreme changes in precipitation and temperature, in either direction (+/-), have significant implications for disease vectors and pathogen emergence and spread. The next generation early warning systems should be able to collect data that is useful for monitoring a number of different pathogen threats rather than just one. Surveillance and reporting of disease/pathogen incidents need to be improved if we are to prevent potential large-scale spread of diseases, and societies at large need to be better prepared for surprise extreme events under changing climate conditions.

Discussion

Risk assessment and modelling can play a role in increasing effectiveness and efficiency in the use of resources in emergencies by better targeting interventions in time and space. One Health approaches should be considered for modelling and early warning systems. One example of a system that uses this type of approach is the RVF Monitor, where satellite monitoring and mapping of key climate conditions and land surface ecological dynamics are an important and integral part of surveillance, and can help reduce the impact of outbreaks. Participants agreed that outputs of the model need to be linked to timely and proportionate action on the ground (surveillance, vaccination, movement controls, zoning etc.) to mitigate the risk of animal and human disease outbreaks. There was interest in the potential of the RVF Monitor model to be adapted as a platform to predict risk of other diseases.

From a regional perspective, risk communication meetings are very effective in supporting a strategic risk-based approach and encouraging stakeholders to act quickly upon receipt of early warning notifications from systems such as the RVF Monitor.

There was interest in the use of risk assessment for targeted ASF surveillance at airports and in the application of this model to other countries with lower capacity and resources for emergency management.

Session 8: [Chaired by Dr Keith Hamilton and Dr Daniel Donachie, OIE, and Dr Fanny Ewann, INTERPOL]

Big Ideas

To conclude the workshop, the participants were asked, ‘where could the greatest gains be made to improve sustainable emergency management?’

Participants agreed that “one model does not fit all” and that, as demonstrated through the presentations from the workshop, emergency management is an extensive and complicated field, even in those countries with a high level of resources and capacity.

To reduce the risk of animal health events becoming emergencies, it is important to identify the factors that drive explosive outbreaks of exotic diseases and fluctuations in the incidence of endemic disease in lower-resources settings. Data collected by the OIE and its partners could be used to conduct epidemiological studies to determine these factors, so that targeted risk reduction and prevention strategies can be developed and implemented. It is likely that the driving factors will include inadequate biosecurity, illegal movements of animals, and interactions between wildlife and domestic animals.

There is a need to target the grassroots level by educating farmers and private veterinarians about good biosecurity practices and other risk-reduction and prevention strategies. This should include raising awareness of the threats from (and risk mitigation measures for) intentional or criminal activities. The inclusion of farmers and private veterinarians in contingency planning can strengthen the relationship with the Veterinary Authority. Targeted communications campaigns should aim to help them better understand risk and the costs of disease outbreaks and emergency management from their perspective. Veterinary Services should encourage and reward positive behaviours, such as the implementation of effective biosecurity measures and the prompt reporting of any suspicion of notifiable diseases. Efforts to promote these behaviours can be supported by a strong communication campaign that uses social media, awareness videos, local-level meetings with key stakeholders, etc. The importance of implementing good practices in animal husbandry, nutrition, and routine vaccination to complement biosecurity measures should also be emphasised. Veterinary Services should take a leading role in this regard and ensure that their stakeholders understand risk mitigation measures and the benefits. A fair compensation policy, whether it is cash value of animals or other incentives, should be in place to encourage reporting of disease suspicion, and Veterinary Services should consider business continuity of stakeholders (e.g. producers, private veterinarians) in their decision making. However, compensation strategies should be designed carefully, as they must strongly incentivise livestock owners to apply biosecurity measures, but not encourage criminal or negligent behaviour.

It is important to consider including emergency management in veterinary curricula and continuing professional development. Education and training must not forget veterinary paraprofessionals, who can contribute considerable support to emergency management. By undertaking certain veterinary tasks, such as sample collection (as delegated by the Veterinary Statutory Body), they free up veterinarians for other activities in an emergency.

A sustainable system for managing animal health emergencies requires a multisectoral approach which can rapidly mobilise sufficient resources and provide support for the response activities of Veterinary Services. Working with law enforcement offers multiple benefits, e.g. it increases the safety and security of response personnel (particularly in conflict areas); enables Veterinary Services to obtain assistance in collecting evidence if it is suspected that the outbreak was caused deliberately; allows criminal threat assessments to be conducted jointly, and facilitates intelligence sharing, both in advance of and during an outbreak.

There are strong commonalities between the animal and plant health sectors; for example, they share concerns about the impact of infectious disease on trade and they both rely on laboratories for detection and investigation of outbreaks. These commonalities have led some governments to merge their animal and plant health agencies.

The inclusion of Veterinary Services in national disaster plans and whole-of-government frameworks facilitates resource mobilisation for animal health emergencies, as demonstrated by the example of Botswana. It is often easier to access funds in an emergency than in a peacetime or prevention period, but the mechanisms should be established in peacetime. Veterinary Services should recommend that decision makers invest in emergency preparedness, using arguments from the outcomes of a cost–benefit analysis or a return on investment analysis. It should be argued that investments during peacetime (not just in the emergency phase) pay off in the long term. PPPs offer opportunities to improve the effectiveness and efficiency of emergency management and can create a win-win situation for both the public and private sectors.

Well-designed and well-executed simulation exercises are important for testing whether plans are fit for purpose. Exercises should identify breakpoints in systems. However, many countries lack the expertise and resources to deliver exercises and may need support from the international community or from another country(ies) (through “twinning”) to build capacity for exercising. Any country can make a start by delivering a simple tabletop exercise or drill; the importance of these less-complicated exercises should not be overlooked. Countries can also consider a regional and/or international approach to exercises, which provides additional opportunities to share resources, expertise, and experience, and focus on regional risks. Regional and international collaboration can apply to all aspects of emergency management activities.

The OIE Performance of Veterinary Services (PVS) Pathway and FAO’s Good Emergency Practice Guide can play an important role in capacity building for emergency management. It was suggested that “twinning” of countries, with one country partner being well resourced or having extensive outbreak experience, could enable lower-resource countries to access technical support in the development of preparedness activities such as simulation exercises.

Vaccination strategies can mitigate large-scale outbreaks and will often be the best option for disease control, but it depends on the epidemiology of the disease in question. For example, for Rift Valley fever virus, vaccination will be the best strategy, as vectors, and not animal- to-animal transmission, are the primary mode of dissemination. In contrast, for FMD, biosecurity and management of animal-to-animal transmission would potentially have a greater impact than vaccination. Furthermore, if a vaccine is multivalent it will also be much easier to get buy-in from farmers than if it is a monovalent vaccine.

The meeting highlighted both the range of threats from agro-crime and agro-terrorism and our vulnerabilities to those threats. In addition, it highlighted the fact that the resources needed to carry out a crime/terror-related act can be far outweighed by the resources needed to deal with the multiple economic, health-related and political consequences of such acts. In addition, it highlighted the fact that the resources required to carry out a criminal or terror-related act can be far outweighed by the multiple economic, health-related, and political consequences. Preparedness against agro-crime and agro-terrorism should be integrated into general strategies and planning for animal health crises. It was also highlighted that there was a need to raise awareness of threats from agro-crime and agro-terrorism, and that this should also be done in the context of general awareness raising about animal health emergency management. Security and law enforcement are integral to animal health emergency planning.

Annex-1: Agenda

APPROACHES TO IMPROVING SUSTAINABLE MANAGEMENT OF ANIMAL HEALTH EMERGENCIES

OIE Headquarters, Paris, 26-27 November 2019

Description: The meeting will discuss approaches to improving the sustainability of emergency management capacity, with the aim to reduce risks from agro-terror and agro-crime, as well as natural events.

Format: There will be an emphasis on forward thinking and thought-provoking discussion. Presentations will provide examples to stimulate open discussion.

Participants: Multisectoral experts – animal health, public health, security, law enforcement, livestock sector, government, international organisations, academia, regional representation

Outputs: Outputs of discussion (recommendations, examples of existing models and approaches) will be published (and presented at an OIE Global Conference on Emergency Management in 2021) with a view to guiding future policies in this area.

Time	Day 1: 26 November 2019	Speaker
8:30-9:00	Registration	
9:00-9:10	Welcome remarks	Matthew Stone OIE
Global context Chair: Francesco Berlingieri, European Commission		
9:10-9:25	Setting the scene – OIE’s review of national contingency plans	Keith Hamilton OIE
9:25-9:40	Global review of linkages between Veterinary Service and national emergency management plans	Armaghan Nasim Georgetown University
9:40-9:55	Cost–benefit analysis of investing in emergency preparedness	William Gilbert University of Liverpool
9:55-10:15	Open discussion	All
Resource mobilisation for emergency response Chair: Baptiste Dungu, Onderstepoort Biological Products SOC Ltd		
10:20-10:35	The importance for resource mobilisation of linking animal health emergency response to whole of government frameworks	Odireleng Idy Thololwane Department of Veterinary Services Botswana
10:35-10:50	Solidarity funds	Marie Jousse FMSE
10:50-11:05	Insurance/Reinsurance – does it have a role?	Gary Hutchings DH AgRis
11:05-11:30	Coffee break	
11:30-11:45	Public–private partnership – Namibia experience	Anja Boshoff-de Witt Namibia Meat Board
11:45-12:30	Open discussion	All
12:30-13:30	Lunch	

International cooperation for animal health emergencies Chair: Gail Carson, GOARN Vice Chair		
13:30-13:55	History and guiding principles of the International Animal Health Emergency Reserve (IAHER) and guidance for other countries considering an IAHER-style approach	Sharon Kolek Australian Government Department of Agriculture
13:55-14:10	Testing IAHER – Simulation	Gordon Cleveland USDA APHIS VS OSIC
14:10-14:20	Testing IAHER – Real example	Sharon Kolek Australian Government Department of Agriculture
14:20-14:45	Similarities and differences between international mechanisms to support public health emergencies (GOARN) and animal health emergencies (EMC-AH) and the reasons for these differences	Patrick Drury WHO and Ludovic Plee FAO
14:45-15:25	Open discussion	All
15:25-15:45	Coffee break	
One Health networks and timely delivery of interventions through research and development Chair: Osman Dar, Chatham House		
15:45-16:00	Rift Valley fever – challenges of sustaining preparedness against a periodic emergency	Baptiste Dungu Onderstepoort Biological Products SOC Ltd
16:00-16:15	High-containment laboratory preparedness – opportunities for rapid laboratory response against emerging and existing zoonotic pathogens: leveraging capacity through global alliance	Bradley Pickering CFIA
16:15-16:30	Prioritisation, coordination, and fast-tracking of research and development (WHO R and D blueprint, Global Coordination Mechanism etc.) for zoonotic diseases	Marie-Pierre Preziosi WHO
16:30-16:45	How to rapidly scale-up vaccine development	Mike Whelan CEPI
16:45-17:00	Vaccine reserves – assured emergency supply options (AESOP)	Keith Sumption EuFMD
17:00-17:15	International mechanisms to facilitate animal health research and development in response to emergencies – current situation	Alex Morrow STAR-IDAZ
17:15-18:00	Open discussion	All
Day 2: 27 November 2019		
Planning and exercising for emergencies, including deliberate-release scenarios Chair: Melissa Berquist, IIAD		
9:00-9:15	OIE guidelines on animal health simulation exercises	Daniel Donachie OIE
9:15-9:30	Nordic-Baltic Veterinary Contingency Group – regional simulation exercise approach	Thomas Svensson Nordic-Baltic Veterinary Contingency Group
9:30-9:45	Ensuring cost effectiveness – Celulex exercise	Júlio Gouveia Carvalho Portuguese Army
9:45-10:00	Get Prepared – a framework for better planning and testing of emergency preparedness	Sally Gaynor EuFMD
10:00-10:30	Open discussion	All
10:30-11:00	Coffee break and group photo	
Investigation and response to agro-crime Chair: Adrien Sivignon, INTERPOL		
11:00-11:15	Project RHINO – Including veterinarians in the response to bioterrorism	Fanny Ewann INTERPOL
11:15-11:30	Misinformation, criminal activity – recent experience with ASF outbreaks	Ashish Sutar OIE
11:30-11:45	USDA-FBI model for preparedness training	Stephen Goldsmith FBI

11:45-12:00	Intelligence gathering and analysis for deliberate biological incidents involving animals (agro-crime and agro-terror)	Fanny Ewann INTERPOL
12:00-12:15	Investigation of suspicious outbreaks – OIE guidelines and intersectoral cooperation	Christine Uhlenhaut OIE
12:15-13:00	Open discussion	All
13:00-14:00	Lunch	
Applied information systems and technology Chair: Paolo Dalla Villa, IZSAM		
14:00-14:15	Potential use of risk assessment to inform targeted surveillance at airports for ASF	Lina Mur OIE
14:15-14:30	Bluedot	Matthew German Bluedot
14:30-14:45	READY: The role of coordinated information management systems	Elburg van Boetzelaer Save the children
14:45-15:00	Rift Valley fever – risk mapping and prediction	Assaf Anyamba NASA
15:00-15:40	Open discussion	All
15:40-16:00	Coffee break	
Big ideas		
16:00-17:00	What is a sustainable emergency management system and where can the greatest gains in improving sustainability be made?	All
17:00	Close of the meeting	

Annex-2: List of Participants

APPROACHES TO IMPROVING SUSTAINABLE MANAGEMENT OF ANIMAL HEALTH EMERGENCIES

OIE Headquarters, Paris, 26–27 November 2019

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