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Geneva, Switzerland

28–30 October
2025

#BiothreatReduction25
woah.org

Book of Abstracts of the WOAH Global Conference on Biological Threat Reduction

GLOBAL CONFERENCE ON BIOLOGICAL THREAT REDUCTION

28–30 October 2025
Geneva, Switzerland

World Organisation for Animal Health

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Introduction

Background

Biological threats can have serious consequences for animal health and beyond. While most disease outbreaks occur naturally, the risk of accidental or deliberate introductions cannot be ignored. Although the likelihood of a deliberate or accidental release may be relatively low, the potential consequences can be catastrophic at national, regional or global levels.

Animal pathogens may be used as bioweapons or in agro-crime and agro-terrorism because they have high impact, are easy to acquire or propagate, and can be readily smuggled through borders undetected. In fact, most pathogens that have been used in bioweapons development are of animal origin and are WOAH-listed diseases. Further, 80% of pathogens with bioterrorist potential are zoonotic pathogens, underscoring the interconnected nature of animal, human and environmental health.

The most effective way to limit threats from animal pathogens is to strengthen existing animal and human health systems for surveillance, early detection and rapid response, which are there to deal with everyday outbreaks of infectious diseases. An infectious disease outbreak follows the same course irrespective of how it was initiated, whether it was a natural event, a laboratory accident or a terrorist attack, and the mechanisms to detect and control outbreaks are fundamentally the same.

WOAH focuses on developing and strengthening cross-links between existing health systems and security, applying the One Health approach, for surveillance, early detection and rapid response to disease outbreaks whether natural, accidental or deliberate.

In today's rapidly changing and complex world, it is more important than ever to partner across sectors to prevent, prepare for and respond to biological threats.

Purpose

The Global Conference on Biological Threat Reduction will address the dynamic landscape of biological threats by reflecting on historical experiences, discussing current challenges and anticipating future risks. Coinciding with the 50th anniversary of the Biological Weapons Convention and the 100th anniversary of the Geneva Protocol, this event will reinvigorate international efforts in biological threat reduction. Hosted by the World Organisation for Animal Health (WOAH), the Conference aims to spark multi-sectoral collaboration, integrating insights from animal health and beyond to share and develop innovative strategies for safeguarding global health security.

Objectives

- **Learn from the past and prepare for the future:** Address the dynamic landscape of biological threats by examining historical events, current challenges, and anticipating future threats. Build on previous conferences by reflecting on recommendations and showcasing advancements in WOAH Member capabilities;

- **Strengthen international efforts in biological threat reduction:** Enhance global and national cooperation on biological threat reduction through tangible commitments from national, regional and international entities;

- **Foster multi-sectoral partnerships in global health security:** Promote knowledge sharing and actionable collaboration across diverse disciplines;

- **Identify innovative strategies:** Promote collaboration between animal health and other sectors, to develop and share innovative strategies for addressing present and future biological threats.

Expected Outcomes

- Recognise the importance of animal health and the One Health approach in biological threat reduction;

- Support situational awareness and risk management with case studies and a global stocktake of biological threat reduction efforts;

- Facilitate access to resources, strengthen network connections and identify practical pathways for cross-sectoral collaboration;

- Secure commitments to strengthen cross-sector partnerships, dialogue and tangible action to tackle biological threats.

Conference Organisation

Scientific Committee

Mr Trevor Smith
Global Affairs Canada's Weapons Threat Reduction Program, *Canada*

Dr Max Brackmann
Spiez Laboratory, Federal Department of Defence, *Switzerland*

Dr Fanny Ewann
INTERPOL

Dr Nahoko Shindo
World Health Organization (WHO)

Dr Pascal Hudelet
Boehringer Ingelheim representing Health For Animals

Dr Clarissa Rios Rojas
Biological Weapons Convention (BWC) Implementation Support Unit (ISU)

Dr Julio Carvalho
Portuguese Army, *Portugal*

Dr Primal Silva
Consultant and Former Chief Science Operating Officer, Canadian Food Inspection Agency, *Canada*

Dr Salama Al Muhairi
National Emergency and Crisis Management Authority, *United Arab Emirates*

Dr Debbie Eagles
Australian Centre for Disease Preparedness (CSIRO), *Australia*

Dr Kirk Douglas
Centre for Biosecurity Studies, University of West Indies, *Barbados*

Dr Zibusiso Masuku
the National Institute for Communicable Diseases of South Africa, *South Africa*

Dr Andrew Nerlinger
Global Health Security Fund

Dr Chong Chee Kheong
ASEAN Mitigation of Biological Threats (MBT) program

Dr Nick Lyons
Food and Agriculture Organization of the United Nations (FAO)

WOAH Organising Committee

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Preparedness and Resilience Department

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Preparedness and Resilience Department

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Ms Corina Monagin
Engagement and Investment Department

Ms Nada Essawy
Engagement and investment Department

Mr Ian Peter Busuulwa
Sub-Regional Representation for Eastern Africa

Dr Chadia Wannous
One Health

Programme

Provisional Programme
Please note titles and timings of sessions may change

Tuesday 28 October 2025

08:30—10:00	Registration

10:00—11:35 Opening Session

Chair: Montserrat Arroyo
WOAH Deputy Director for International Standards and Science

10:00—10:30	**Opening Ceremony**	**Emmanuelle Soubeyran** WOAH Director General **Trevor Smith** Deputy Director & Senior Program Manager - Biological & Chemical Security, UNSCR 1540 Implementation, Global Affairs Canada Weapon's Threat Reduction Program **John Steenhuisen** Minister of Agriculture, *South Africa*	**Ahmed Naser Al-Raisi** President of INTERPOL **Julien Thöni** Permanent Representative of Switzerland to the Conference on Disarmament, Permanent Mission of Switzerland to the United Nations Office and other international organizations in Geneva
10:30—11:35	**Keynote speaker**	**Keynote speaker (TBC)**	**Chair: Emma Ross** Chatham House

11:40—12:40 Session 1
One Health and Security: a multi-sectoral approach to biological threat reduction

This high-level panel discussion will examine the intersection of One Health and Security, highlighting shared strategic priorities across sectors to strengthen collective action. The session will explore what constitutes a truly multi-sectoral approach to preventing, preparing for, detecting, and responding to biological threats. Panellists will identify key challenges and propose solutions for effective collaboration. The discussion will also address the role and level of security sector engagement in One Health, examine relevant terminology, and consider pathways for future progress.

Chair: Chadia Wannous
WOAH

11:40—12:40

Wanda Markotter
One Health High Level Expert Panel (OHHLEP) and University of Pretoria

Agnès Romatet-Espagne
General Secretariat for Defense and National Security (SGDSN), *France*

Naomi Acquah
Ghana Police Service, INTERPOL National Central Bureau Accra

David Harper
Harper Public Health Consulting Limited and Chatham House

Christian Arioli
Spiez Laboratory, *Switzerland*

12:40—13:45

Lunch Break

13:45—15:15

Session 2
The Biological Threat Landscape: drivers, current challenges and the future

This session will explore the drivers of biological threats and examine the current and emerging threat landscape emphasising the need for a multi-sectoral approach. The discussion will include factors such as geopolitical changes, conflict, climate change, and public perception of risk. Historical and contemporary case studies will be used as well.

Chair: Clarissa Rios
Biological Weapons Convention Implementation Support Unit (BWC-ISU)

13:45—14:00	**The Dominoes We Don't See: Rethinking Global Biothreat Systems as Intersections and Cascades**	**Alex Tasker** University of Bristol
14:00—14:15	**Geopolitical Long-Term Drivers**	**Tania Sollogoub** Crédit Agricole Group
14:15—14:30	**Re-Emergence of Anthrax in Nigeria: Lessons for Biological Threat Reduction**	**Ishiaku Mohammed** Animal Health and Reproductive Services Department, *Nigeria*
14:30—14:45	**Understanding the Drivers of Foot and Mouth Disease Spread: The Indonesian Experience**	**Hendra Wibawa** Ministry of Agriculture, *Indonesia*
14:45—15:15	**Discussion**	**All speakers**

Side Event
Safeguarding Africa's Bioeconomy

Signature Initiative to Mitigate Biological Threats in Africa (SIMBA)

Partnership between the G7-led Global Partnership and the Africa CDC

15:15—15:45

Refreshment Break

15:45—17:15

Session 3
Deliberate Biological Events: Agro-crime, agro-terrorism and bio-terrorism

This session will focus on deliberate biological events with particular attention to agro-crime, agro-terrorism, and bio-terrorism. Using real-world case examples, the discussion will highlight lessons identified and good practices for stakeholders working at the intersection of health and security.

Chair: Adrien Sivignon
the International Criminal Police Organization (INTERPOL)

15:45—16:00	**A Case Study Approach to Agro-crime and Bio-terrorism**	**Stephen Goldsmith** Federal Bureau of Investigation (FBI), *United States of America (USA)*
16:00—16:15	**Industry Perspectives on Agro-crime and Agro-Terrorism**	**Quincy Lissaur** S-SAFE
16:15—16:30	**Multi-sectoral Collaboration in the Investigation of Suspicious Biological Events**	**Fanny Ewann** INTERPOL
16:30—16:50	**Strengthening Cooperation between Veterinary Services and Law Enforcement in Tunisia to Counter Agro-crime and Agro-terrorism**	**Mohamed Elias Barbria** General Directorate of Veterinary Services, *Tunisia* **Ahmed Kasraoui** General Directorate of National Security, *Tunisia*
16:50—17:15	**Discussion**	**All speakers**

17:20—18:15

Session 4
Beyond Traditional Biothreats

This session will explore **underrepresented threats** in biological threat reduction such as biotoxins, illegal wildlife trade, and pathogens currently not included on international biothreat lists.

Chair: Anne-Sophie Lequarré
European Commission

17:20—17:35	**Beyond Conservation and Security: Public Health Consequences of Wildlife Trafficking**	**Simone Haysom** Global Initiative Against Transnational Organized Crime

Side Event
Countering Disinformation and Misinformation Workshop

United Nations Interregional Crime and Justice Research Institute (UNICRI)

17:35—17:50	**Biological Threats: Beyond Pathogen Lists**	**Julio Carvalho** Portuguese Army
17:50—18:05	**Biotoxin Analysis within the Framework of the Chemical Weapons Convention**	**Karina Vignati** Organisation for the Prohibition of Chemical Weapons (OPCW)
18:05—18:20	**Discussion**	**All speakers**

18:20

Welcome reception and poster session

Wednesday 29 October 2025

09:00—10:30

Session 5
Emerging Technologies - Opportunities and Risks in Biological Threat Reduction

This panel discussion will delve into opportunities and risks with emerging technologies in biological threat reduction.

Chair: Loren Matheson
Defence Research and Development Canada

09:00—10:30

Global Partnership CBRN Working Group Co-Chair

Cindy Vestergaard
Stimson Center

Elodie Liobard
INTERPOL

Whitney Bowman-Zatzkin
Bioeconomy Information Sharing and Analysis Center (BIO-ISAC)

Brad Pickering
Canadian Food Inspection Agency (CFIA)

10:30—11:00

Refreshment Break

11:00—12:30

Session 6
Sustainable Laboratories

Many laboratories around the world suffer from sustainability challenges that undermine performance, safety and security. This session is forward looking and will explore solutions that can improve the sustainability of laboratories, particularly in low to middle income settings.

Chair: Zibusiso Masuku
Africa CDC

11:00—11:15	**The Biosafety Research Roadmap: Building Evidence to Support Risk Management**	**Allan Bennett** Consultant
11:15—11:30	**A Deep Dive into Sustainable Laboratory Programming, Design, Construction and Operations**	**Gregers Chalker** POND/AFMS
11:30—11:50	**BioPrevail: Finding Solutions through Design Sprints**	**Lisa McDonald** Global Health Security Fund
11:50—12:30	**Discussion**	**All speakers**

Side Event
Fostering Collaboration between Law Enforcement and Veterinary Services

WOAH and INTERPOL

12:30—14:00

Lunch Break

14:00—15:30

Session 7
Advances in Surveillance and Diagnostic Technologies for Biological Threat Reduction

This technical session showcases **advances** in **surveillance** and **diagnostic technologies** that could support biological threat reduction.

Chair: Primal Silva
former Chief Science Operating Officer at CFIA

14:00—14:15	**Strengthening One Health Security through Smarter Biosurveillance**	**Ekta Patel** International Livestock Research Institute (ILRI)
14:15—14:30	**Optimising Use of Next Generation Sequencing for One Health Biothreat Reduction**	**Sam Yingst** Columbia University

Side Event
Leveraging the Expertise of the EU CBRN Centres of Excellence to Strengthen 'One Health' Approaches in Reducing Biological Threats

14:30—14:45	**Faster, Smarter, Stronger: How Advances in Artificial intelligence can Transform Multisectoral Readiness and Resilience to Global Biological Threats**	**Kamran Khan** BlueDot Inc
14:45—15:00	**Attribution of a Biological Animal Health Event using Diagnostic and Surveillance Data**	**Michael Bryan** Oxford University
15:00—15:30	**Discussion**	**All speakers**

15:30—16:00

Refreshment break

16:00—17:35

Session 8
Sustainable Approaches in Emergency Management

This session will explore practical and sustainable approaches to managing animal health emergencies through real-world case studies and cross-sector collaboration. Presentations will highlight national and regional responses to transboundary animal diseases, industry perspectives, and simulation exercises.

Chair: Dr Kirk Douglas
University of West Indies

16:00—16:25	**Lessons in Foot and Mouth Disease: Response from Hungary and Slovakia**	**Martin Chudy** State Veterinary and Food Administration, *Slovakia*
16:25—16:40	**The Livestock Industry in Emergency Management: Poultry Sector Views**	**Nicolò Cinotti** International Poultry Council
16:40—16:55	**Strengthening Resilience to Cross-border Diseases in Chad**	**Singambaye Ghislaine Mbeurnodji** General Directorate of Veterinary Services, *Chad*
16:55—17:10	**A One Health Transboundary Simulation Exercise in Jordan and Iraq**	**Ekhlas Hailat** Johns Hopkins Affiliate
17:10—17:35	**Discussion**	**All speakers**

17:35—17:45

Poster Prize Awards Ceremony

Thursday 30 October 2025

09:00—10:30

Session 9
Strengthening Global Frameworks for Biological Threat Reduction

This panel discussion will explore how existing global biosecurity, non-proliferation, and disarmament frameworks, such as the Biological Weapons Convention and the United Nations Secretary General Mechanism, can be leveraged to advance biological threat reduction. The session will examine the relevance of these agreements to the animal health sector and highlight opportunities to strengthen coordination between health, security, and diplomatic communities. Discussions will focus on practical ways to enhance implementation and demonstrate the critical role of animal health systems in supporting global biosecurity objectives

Chair: Keith Hamilton
WOAH

09:00—10:30

Frederico S. Duque Estrada Meye
Permanent Delegation of Brazil to the Conference on Disarmament

Debbie Eagles
Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Australia*

Trevor Smith
Global Affairs Canada, *Canada*

Maximilian Brackmann
Spiez Laboratory, *Switzerland*

10:30—11:00

Refreshment Break

11:00—12:00

Session 10
Advocacy and Investment Strategies for Biological Threat Reduction

This session will explore effective strategies for advocating for resources and sustained investment in biological threat reduction. It will highlight good practices in political engagement, including how to communicate with parliamentarians, ministers, and other decision-makers. Drawing on insights from previous sessions, the discussion will address the critical question of funding—

Chair: Emma Ross
Chatham House

Side Event
Cross-sectoral investigation exercise

World Health Organization (WHO)

how to secure the necessary support to turn plans into action. The session will also consider how to frame biological threats within the broader context of national and global priorities, adapting to evolving realities.

11:00—12:00

Wilmot James
Brown University

Christine Middlemiss
Department for Environment, Food & Rural Affairs, *United Kingdom*

Willo Brock
Coalition for Epidemic Preparedness Innovations (CEPI)

Pascal Hudelet
Health for Animals / Boehringer Ingelheim

Madhur Dhingra
Food and Agriculture Organization of the United Nations (FAO)

12:00—13:30

Lunch Break

13:30—14:30

Session 11
Taking Action for Collective Biological Threat Reduction

Chair: Tom Inglesby
Johns Hopkins Center for Health Security

13:30—14:30

Interactive session with audience

14:30—15:00

Refreshment Break

Close of Conference

Chair: Baba Soumare
WOAH Deputy Director for Global Frameworks and Capacity Building

15:00—15:45 **Conclusions**

15:45—16:00 **Closing ceremony**

Presentation Abstracts

Session 2

The Biological Threat Landscape: Drivers, Current Challenges and the Future

Session 2.1

The Dominoes We Don't See: Rethinking Global Biothreat Systems as Intersections and Cascades

Date & Time	Author	
Tuesday 28 October 13:45 – 14:00	**Dr Alex Tasker** University of Bristol, *UK*	alex.tasker@bristol.ac.uk ORCID

Our understanding of the origins and impacts of biological threats shape how we engage and respond to them. Tightly defined biothreat preparedness, detection, response, and recovery systems can enable the rapid mobilisation of resources and provide measurable outcomes, but may fail to represent the complex realities and relationships driving emerging and future risks. Biological threats are embedded in overlapping human, animal, environmental and political landscapes, systems which often interact in unpredictable ways resulting in shocks that cascade across and within dynamic settings. This presentation proposes that to strengthen biopreparedness, biosecurity and biodefence we must rethink biological threats to actively engage with intersections and cascades, rather than continuing to frame them as isolated events. Drawing on interdisciplinary research and case examples, this presentation positions biological threats within dynamic systems of intersecting drivers, which include economic dependencies, global supply chains, climate shocks and geopolitical tensions; which in turn can create and amplify domino effects rarely visible in advance. The presentation develops an illustration of ways in which non-biothreat communities are engaging with these new forms of intersectional uncertainty, challenging us to think differently about the biological threat landscape to better address persistent drivers, current challenges, and grasp future opportunities.

Keywords:
Agro-crime, Antimicrobial resistance, Biopreparedness, Cascading risks, Climate change, One Health, Security, Surveillance, Systems thinking.

Session 2.2
Re-Emergence of Anthrax in Nigeria: Lessons for Biological Threat Reduction

Date & Time	Author	
Tuesday 28 October 14:15 – 14:30	**Dr Ishiyaku Musa Mohammed** Federal Ministry of Livestock Development, *Nigeria*	ishiyakum@gmail.com

Anthrax, caused by *Bacillus anthracis*, re-emerged in Nigeria in July 2023 after nearly two decades without reported cases. The outbreaks in Niger and Lagos States highlighted the capacity of neglected zoonoses to rapidly escalate into biological threats with transboundary implications. Between July 2023 and January 2024, Nigeria recorded 1,352 suspected anthrax cases, of which 53 were laboratory-confirmed with 40 livestock deaths, yielding an average case fatality rate of 75.5%. Given anthrax's persistence in the environment and potential misuse as a bioweapon, the Nigerian experience raises a critical question: how can lessons from this response inform sustainable strategies for biological threat reduction, with emphasis on surveillance, vaccination, multi-sectoral partnerships, and risk communication under a One Health framework?

This analysis combines epidemiological data from outbreak investigations in Niger and Lagos States, national surveillance reports, and coordinated multi-sectoral response activities between July 2023 and January 2024. Following confirmation of the outbreaks, the Nigerian government activated Emergency Operations Centres at the federal and state levels to coordinate interventions. Risk-based vaccination campaigns were launched in high-risk states, supported by the deployment of 50,000 vaccine doses to Lagos. Surveillance was intensified at inter-state checkpoints, borders, abattoirs, and livestock markets to detect and contain further spread. Simultaneously, targeted risk communication and community engagement campaigns were conducted in abattoirs, bushmeat markets, pastoralist communities, and hunting groups. The response also fostered collaboration across veterinary services, veterinary teaching hospitals, private practitioners, and One Health risk communication officers to ensure harmonised messaging and coordinated action.

Nigeria's anthrax outbreak highlights both vulnerabilities and opportunities in reducing biological threats. The response reinforced the importance of ongoing vaccination programs and improved surveillance systems, while also stressing the value of multi-sectoral partnerships that bring together veterinary, human health, and environmental stakeholders under a One Health approach. Risk communication and community engagement proved essential in reducing high-risk practices, and their institutionalisation is vital for long-term resilience. To sustain these efforts, strategies must be supported by enhanced diagnostic capacity, safe carcass disposal, and stronger cross-border coordination. Overall, these lessons provide a blueprint for developing sustainable biological threat reduction systems in Nigeria and around the world.

Keywords:
Anthrax, One Health, Outbreak response, Public health security, Risk communication, Surveillance, Transboundary animal diseases, Vaccination, Zoonoses.

References:

[1] Aborode AT, Ojo-Akosile T, Uwah EA, Ottoho E, Ogunleye SC, Kamaldeen AB, *et al*. The outbreak of anthrax in Nigeria: re-enforcing One Health. New Microbes New Infect. 2023;55:101189. https://www.doi.org/10.1016/j.nmni.2023.101189

[2] Ogunleye SC, Olorunshola MM, Fasina KA, Aborode AT, Akinsulie OC, Amoo A, *et al*. Anthrax outbreak: exploring its biological agents and public health implications. Front. Trop. Dis. 2024;4:1297896. https://doi.org/10.3389/fitd.2023.1297896

[3] Al-Mustapha AI, Oyewo M, Abubakar AT, Bamidele F, Ibrahim H, *et al.* The re-emergence of anthrax in Nigeria. IJID One Health. 2023;1:100010. https://doi.org/10.1016/j.ijidoh.2023.100010

[4] Rumide TS, Samuel E, Oni O. Anthrax outbreak in Nigeria: an issue for concern? J. Infect. Dis. Epidemiol. 2023;9:310. https://doi.org/10.23937/2474-3658/1510310

[5] Olasoju MI, Olasoju TI, Alamu AO, Egbetade AO, Odita CI, Ladan S, *et al*. Re-emergence of anthrax in Nigeria: a public health threat – epidemiological insights from Niger and Lagos States. Niger. Vet. J. 2025;46(1):60-72. https://doi.org/10.4314/nvj.v46i1.5

[6] Asante M. Anthrax outbreak in Nigeria. The African Observer [Internet]. 2023.

[7] Federal Ministry of Agriculture and Rural Development (FMARD). Confirmation of anthrax outbreak in Nigeria. Abuja (Nigeria): Nigeria Centre for Disease Control; 2023. Available at: https://ncdc.gov.ng/news/491/confirmation-of-anthrax-outbreak-in-nigeria (accessed on 5 October 2025).

[8] Agbo J. Curtailing spread of anthrax in Nigeria. The Nation Newspaper [Internet]; 2023.

[9] Umoru H. Outbreak of anthrax: senate tasks FG on nationwide vaccination of livestock. Vanguard News [Internet]; 2023.

[10] National Biosafety Management Agency (NBMA). NBMA cautions as government confirms first case of anthrax in Nigeria. Abuja (Nigeria): NBMA; 2023. Available at: https://nbma.gov.ng/nbma-cautions-as-government-confirms-first-case-of-anthrax-in-nigeria (accessed on 5 October 2025).

Session 2.3
Understanding the Drivers of Foot and Mouth Disease Spread: The Indonesian Experience

Date & Time

Tuesday 28 October
14:30 – 14:45

Authors

Hendra Wibawa
Directorate General of Livestock and Animal Health Services, Ministry of Agriculture, *Indonesia*

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ORCID

Dhony Kartika Nugroh, M. Fauzy, Pebi Purwo Suseno
Directorate General of Livestock and Animal Health Services, Ministry of Agriculture, *Indonesia*

Indonesia, once recognised as free from foot and mouth disease (FMD), reported reintroduction of the virus in 2022. The outbreak was caused by serotype O/ME-SA/Ind-2001e, genetically related to strains circulating in Asia. This presentation highlights the major risk factors and drivers that facilitated the spread and complicated control measures.

Epidemiological data from 2022–2025, laboratory confirmation by the National Reference Laboratory and international partners, and field observations from veterinary services were analysed. Key risk factors were identified through outbreak investigations, genetic characterisation, and monitoring of livestock movements.

The spread of FMD was strongly influenced by illegal importation of animals and animal products through informal entry points, significant price disparities between regions, and unregulated animal trade to meet high consumer demand. Within-island spread was accelerated by multiple transport routes lacking veterinary checkpoints. Seasonal livestock movements, particularly during religious and cultural festivals, further amplified transmission. Control efforts were challenged by cross-border threats from endemic neighbours, limited vaccine supply and coverage, logistical barriers, weak surveillance, and underreporting. Indonesia's experience demonstrates that structural drivers—illegal trade, socio-economic pressures, large-scale seasonal animal movement, and

limited enforcement capacity—remain central to FMD risk management. National strategies including zoning, risk-based vaccination, digital surveillance (iSIKHNAS), and stronger international cooperation have been adopted. Addressing these drivers is critical to reducing the risk of reintroduction and supporting long-term FMD eradication goals.

Keywords:
Animal movement, Foot and mouth disease, Illegal trade, Indonesia, Risk factors, Surveillance, Transboundary disease, Vaccination.

Session 3

Deliberate Biological Events: Agro-crime, Agro-terrorism and Bio-terrorism

Session 3.1
A Case Study Approach to Agro-crime and Bio-terrorism

Date & Time	Author
Tuesday 28 October 15:45 – 16:00	**Stephen W. Goldsmith DVM** Management and Program Analyst, US Department of Justice Headquarters, Federal Bureau of Investigation, Counterterrorism Division, Branch 1 WMD Section, Chemical Biological Countermeasures Unit, *United States of America*

The author will deliver a presentation that explores the different meanings and uses of the terms Bio- and Agro-terrorism. It will also discuss Agro-crimes as a tool for Law Enforcement and Veterinary Services agency personnel to perform epidemiological and criminal or counterterrorism investigations.

The discussion includes the five primary categories of threat actors and threat activities against the public health, food and agriculture sectors and the assumption that biological incidents are low probability but high consequence incidents. Additionally, a list of the six categories of potential techniques for attacking and disrupting the public health and animal agricultural production infrastructure is described. Discussions include the analytical considerations used for attribution of suspicious disease introductions as either normal, accidental, natural or intentional disease incidents as well as a list of the critical indicators or triggers characteristic of intentional biological attacks.

The value of performing joint suspicious incident notifications between Law Enforcement and Veterinary Services is discussed throughout. The presentation ends with case studies of five instances of biological incidents that targeted public health and animal agriculture in the United States with discussion of the attribution investigations to determine if the incidents were intentional or accidental and, if intentional, how the investigations determined which agencies were responsible for identifying the perpetrators, the techniques used in the attacks, and the resolution of the investigations.

All source material and information were extracted from existing FBI joint investigation course presentations and unclassified external threat awareness information products used by FBI WMD program personnel.

Keywords:
Agro-terrorism, Bio-terrorism, Law enforcement, Veterinary Services.

Session 3.2
Multi-sectoral Collaboration in the Investigation of Suspicious Biological Events

Date & Time	Author	
Tuesday 28 October 16:15 – 16:30	**Fanny Ewann** Bioterrorism Prevention Unit, CBRNE and Vulnerable Targets Sub-Directorate, INTERPOL General Secretariat, *France*	f.ewann@interpol.int ORCID

Unlike other human-made threats, the detection of biological threats relies much more on indicators than equipment monitoring. Those indicators are generally not well known by frontline officers, whether they belong to health or law enforcement services, mainly because they fall at the interface of the work of those two communities. Once those indicators of suspicion are identified, determining the source, confirming the eventual criminal intent and motivation of the perpetrator(s) requires a thorough investigation by both the health and law enforcement services at that same interface. Both services have specific resources, expertise and access to information that are essential to share in order for each service to fulfil their respective mandate and missions in the most efficient way, which for law enforcement – should criminal behaviour be confirmed – means a case leading to successful prosecution. For these two sectors to work effectively together there must be mutual understanding and trust, which cannot be built overnight but can be fostered through the establishment of proper frameworks and partnerships. Drawing on concrete examples, this presentation will explore the challenges and enablers of such cooperation, in particular in the context of the investigation of suspected agro-crime incidents, at national, regional and international levels.

Keywords:
Agro-crime, Agro-terrorism, Indicators, Information sharing, Interagency cooperation, Investigation.

Session 3.3
Strengthening Cooperation between Veterinary Services and Law Enforcement in Tunisia to Counter Agro-crime and Agro-terrorism

Date & Time

Tuesday 28 October
16:30 – 16:50

Authors

Mohamed Elias Barbria
Official Veterinary Inspector and Policy Officer, Member of the Tunisian CBRNE National Team, Directorate of Standardization and Border Sanitary Control, General Directorate of Veterinary Services, Tunisian Ministry in charge of Agriculture, *Tunisia*

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Ahmed Kasraoui
Senior Police Officer, National Unit for Investigation of Terrorism and Organized Crime Affecting National Territory Integrity, General Directorate of National Security, *Tunis, Tunisia*

Agro-crime and agro-terrorism represent growing threats to public health, food security and national stability. Tunisia has recognised the importance of an integrated response and has developed a national framework to strengthen cooperation between Veterinary Services and Law Enforcement agencies. This approach is based on the understanding that biological threats cannot be effectively addressed in isolation, but require coordinated, multi-sectoral engagement.

This presentation highlights Tunisia's experience in building both operational and strategic partnerships between veterinary and security authorities. It examines the mechanisms established to share information, conduct joint risk assessments, and enhance preparedness and response capacities for deliberate biological events. A key milestone was the completion of a capacity analysis, conducted in collaboration with INTERPOL, which identified strengths, gaps and priority areas for action.

Practical initiatives have followed, including joint training programmes, simulation exercises, and the development of operational protocols. These efforts have helped build institutional trust, clarify roles and responsibilities, and establish

sustainable mechanisms for inter-agency collaboration. Tunisia's model demonstrates that high-level political engagement, combined with practical cooperation at the operational level, can significantly strengthen national resilience against agro-crime and agro-terrorism.

Beyond the national context, Tunisia's experience provides lessons of broader relevance. By integrating veterinary and law enforcement expertise, vulnerabilities across the food chain can be reduced, and the capacity to detect, prevent and respond to biological incidents is enhanced. This joint approach also supports international efforts to build global resilience against agro-terrorism, while contributing to the protection of public health and the safeguarding of food systems.

By sharing achievements, challenges and opportunities for further development, this presentation aims to inspire other countries to adopt similar approaches. It also emphasises the importance of sustained international cooperation, capacity building and knowledge exchange in addressing the complex and evolving threats posed by agro-crime and agro-terrorism.

Keywords:
Agro-crime, Agro-terrorism, Biological threats, Inter-agency collaboration, Law enforcement, Veterinary Services.

Session 4
Beyond Traditional Biothreats

Session 4.1
Beyond Conservation and Security: Public Health Consequences of Wildlife Trafficking

Date & Time	Author	
Tuesday 28 October 17:20 – 17:35	**Simone Haysom** Director of Environmental Crime and Head of ECO-SOLVE, Global Initiative Against Transnational Organized Crime, *Switzerland*	Simone.Haysom@globalinitiative.net

Wildlife trafficking is an under-recognised public health threat, creating repeated interfaces for zoonotic spillover and other risks. Along the trade chain, poachers and rural workers face direct exposure to high-risk species; unregulated farming amplifies pathogens; and transport spreads infected animals and smuggled venomous species. Consumption practices increase foodborne and cultural exposure, while health crises fuel demand for traditional medicines. Enforcement and rescue operations without biosecurity also risk seeding outbreaks, as can poorly managed releases of animals. This presentation traces these risks through case studies, calling for stronger One Health integration, biosecurity standards, and risk-based management across all stages of trade.

Keywords:
One Health, Smuggling, Wildlife, Zoonotic spillover.

Session 4.2
Biological Threats beyond Pathogen Lists

Date & Time	Author	
Tuesday 28 October 17:35 – 17:50	**Júlio Gouveia-Carvalho** Biological and Chemical Defence Laboratory, Portuguese Army, *Portugal*	carvalho.jmcfg@exercito.pt ORCID

Biological threat preparedness has traditionally focused on a limited set of high-profile pathogens included in official lists of concern. However, this narrow framing overlooks a large group of neglected or emerging pathogens that are not formally listed yet pose significant risks to human, animal and plant health, with cascading impacts on global food security, trade and public health systems. These neglected agents, ranging from understudied zoonotic viruses and bacterial strains in wildlife reservoirs, emerging fungal infections in crops, to parasites with shifting geographic ranges, can generate substantial morbidity, mortality and economic disruption when ecological or socio-economic conditions enable their emergence.

The neglect arises from several factors: limited surveillance capacity, absence of diagnostic tools, insufficient commercial incentives for countermeasure development, and a lack of systematic inclusion in risk assessment frameworks. Yet, climate change, increased mobility of people and goods, antimicrobial resistance, and intensifying agricultural practices amplify the likelihood that such overlooked pathogens cross species barriers, adapt to new hosts, or trigger outbreaks in naïve ecosystems. Importantly, past crises have demonstrated that disruptive biological events often originate outside official watchlists, revealing critical blind spots in preparedness planning.

Currently there is a paradigm shift in biological threat governance, trending to a risk-based approach, considering the continuum of biological threat landscape. Prospectively, a horizon-scanning approach should aim to integrate neglected pathogens into global early-warning systems. Strengthening cross-sectoral surveillance, promoting open data sharing, and investing in flexible diagnostic and response platforms will be essential. Veterinary Services, in partnership with public health and phytosanitary services, can play a pivotal role by fostering coordinated frameworks that recognise neglected pathogens as integral to biological threat preparedness. Expanding beyond current lists is not merely an academic exercise, it is a strategic necessity to mitigate unforeseen risks at the human–animal–plant interface in an interconnected world.

Keywords:
Emerging pathogens, Fungi, Horizon-scanning, Parasites, Risk.

Session 4.3
Biotoxin Analysis within the Framework of the Chemical Weapons Convention

Date & Time

Tuesday 28 October
17:50 – 18:05

Authors

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Biotoxins are toxic chemicals usually obtained from biological source materials. Two specific biotoxins are listed in Schedule 1 of the Annex on Chemicals of the Chemical Weapons Convention (CWC): saxitoxin (STX), which is a small molecule, and ricin, which is a large protein. As part of the Technical Secretariat, the OPCW's Verification Division works towards achieving chemical disarmament and preventing the re-emergence of chemical weapons. The OPCW Laboratory, which is part of the Verification Division, provides support for these verification activities, which includes the development and evaluation of methods for analysis of biotoxins.

The activities on biotoxin analysis are partially based on the work of the Temporary Working Group (TWG) on the Analysis of Biotoxins, which was established under the OPCW Scientific Advisory Board (SAB) in 2021. Funded by the European Union, this international group of independent experts reviewed science and technology relevant to biotoxin analysis and identified key considerations for investigating alleged use. Their recommendations, published in the final report SAB/REP/1/23 (April 2023), are grouped into six categories:

- In-field detection and identification
- Most relevant biotoxins to consider
- Forensic considerations
- Laboratory analysis and best practices
- Reporting criteria and testing
- International cooperation and coordination.

Following these recommendations, the OPCW has undertaken several initiatives. Building on progress in laboratory expertise and performance, demonstrated through seven years of biotoxin analysis exercises (2016–2022), the OPCW Laboratory organised two trial proficiency tests (in 2024 and 2025), to explore the establishment of an official OPCW proficiency test for biotoxin analysis. In addition, the OPCW is pursuing capacity building, method development, and the creation of validation tools for biotoxin analysis within the framework of verification activities and forensic investigations. The OPCW is also working towards harmonisation and closer collaboration with the United Nations Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons (UNSGM), as well as with other organisations and laboratories from diverse sectors. These efforts aim to develop an informal international network to strengthen global biotoxin analysis capabilities.

Keywords:
Biotoxins, Chemical weapons convention, OPCW, Ricin, Saxitoxin, Verification.

Session 5

Emerging Technologies: Opportunities and Risks in Biological Threat Reduction

Session 5.1

Technology on the EDGE: Industry 4.0 and Biological Threat Reduction

Date & Time	Author	
Wednesday 29 October 09:00 – 10:30	**Cindy Vestergaard** Stimson Center, Washington, DC, *USA*	cvestergaard@stimson.org

A global industrial transition is underway, from the digital automation and computing of the Third Industrial Revolution (Industry 3.0) towards the cyber-physical systems and decentralised technologies that will dominate Industry 4.0. Unlike past industrial shifts, several key technologies, such as artificial intelligence (AI), additive manufacturing (AM), synthetic biology (synbio), and quantum technologies (QT), are maturing and converging simultaneously, introducing a new set of dual-use risks that complicate biological threat reduction – and can also be used to mitigate them.

Many dual-use risks are clear, such as the rise of "fraud-as-a-service" and the democratisation of deception, enabling malicious actors to falsify biological data, tamper with supply chains, or manipulate verification processes. There are already known AI models that can identify novel toxic chemicals, and synbio can lower barriers for engineering known and novel biochemicals and pathogens. At the same time, quantum computing's potential to break current cryptographic systems threatens secure research communications.

This presentation addresses the crucial question of how Industry 4.0 technologies can be leveraged to mitigate and reduce biothreats. Based on results from the ongoing EDGE project, the presentation highlights the need for a paradigm shift, moving from approaches that focus on verifying human activities to also authenticating the integrity of digital and technological processes. Physical inspection will remain a cornerstone, but 'human-in-the-loop' oversight must evolve to include real-time monitoring of automated systems, algorithmic auditing capabilities, and hybrid verification protocols that combine traditional inspection methods with technology-assisted anomaly detection. Effective biothreat reduction requires proactive, forward-looking approaches that account for the convergence of AI, QT, and synthetic biology, supported by international coordination on dual-use research oversight and verification technologies that match the pace of scientific advancement.

Keywords:
Artificial intelligence, Biological threats, Biotechnology governance, CBRN security, Dual-use research, Quantum sensing, Risk mitigation, Synthetic biology.

References:

[1] Vestergaard C, McAllister C, Mueller-Kaler J, Cupitt R, Manning RA, Turner G, et al. A critical juncture: global security and the age of converging technologies. Policy memo. Washington, DC (United States of America): Stimson Center; 2025. Available at: https://www.stimson.org/2025/a-critical-juncture-global-security-and-the-age-of-converging-technologies (accessed on 21 October 2025).

[2] Wilton Park. The good, the bad, and the actionable: a global partnership initiative to counter and leverage WMD relevant technologies. Steyning (United Kingdom): Wilton Park; 2025. Available at: https://www.wiltonpark.org.uk/reports/the-good-the-bad-and-the-actionable-a-global-partnership-initiative-to-counter-and-leverage-wmd-relevant-technologies (accessed on 21 October 2025).

Session 5.2
INTERPOL BioTracker

Date & Time	Author
Wednesday 29 October 09:00 – 10:30	**Elodie Liobard** INTERPOL Criminal Intelligence Analyst, Bioterrorism Prevention Unit, CBRNE and Vulnerable Targets Sub-Directorate, INTERPOL General Secretariat, *France*

INTERPOL BioTracker is the International Criminal Police Organization's tenth Crime Analysis File, a database in indirect access, focusing on biological threats and incidents. Animal disease outbreaks that might trigger law enforcement action, including agro-crime, agro-terrorism, are amongst the biological threats monitored and assessed. The latter also comprise advances in science and technology likely to reduce the barrier of knowledge of non-state actors in developing and using biological agents, toxins and weapons. Funded by Global Affairs Canada's Weapons Threat Reduction Program, INTERPOL BioTracker was created in January 2024 following a three-year feasibility study. The COVID-19 pandemic constituted a momentum confirming the law enforcement role in a high-impact biological incident, whether undeliberate or deliberate. This new analytical capability resulting from a consultative process with INTERPOL member countries and internal units, capitalises on lessons learned and good practices from INTERPOL's unique role and experience in police data management and analysis. Gathering multi-sourced information, INTERPOL BioTracker leverages innovation and technology to enhance the timeliness and completeness of information and to deliver key intelligence, including early warning notifications to law enforcement at a global level. With the establishment of a dedicated Crime Analysis File, an international BioTracker community is born, connecting law enforcement officers focusing on biological threats. From its onset, INTERPOL BioTracker has benefited from strong international support with a high level of participating member countries and diverse geographical representation, which highlights the issues posed by biological threats, globally. With the advances in science and technology, INTERPOL BioTracker will continue to innovate to bring the most pertinent analytical and investigative support to INTERPOL BioTracker membership.

Keywords:
Biological, BioTracker, INTERPOL, Technology, Threat.

Session 5.3
High Consequence Zoonotic Pathogens: Maximising Response by Mitigating Spread

Date & Time	Author
Wednesday 29 October 09:00 – 10:30	**Dr Brad Pickering PhD** Head, Special Pathogens, National Centre for Foreign Animal Disease, Canadian Food Inspection Agency, Government of Canada, Canadian Science Centre for Human and Animal Health, *Canada* bradley.pickering@inspection.gc.ca

Emerging and re-emerging zoonotic pathogens present significant and dramatic consequences for both human and animal health. Many factors contribute to the spread of these high consequence agents, including but not limited to climate change, changing land use, global trade and travel. With increased pressures on biodiverse areas, the risk for zoonotic spillover moves humanity closer to the pandemic era. Mitigating the spillover from intentional or accidental transmission is critical to prevent large scale outbreaks. Development of rapid diagnostics using new technology to complement gold-standard testing is essential to minimise disease spread.

Keywords:
Diagnostics, Spillover, Zoonotic pathogens.

Session 5.4
Understanding Cyberbiosecurity: Unmet Needs, Unintended Consequences in Agriculture and AgBiotech

Date & Time	Author	
Wednesday 29 October 09:00 – 10:30	**Whitney Bowman-Zatzkin** Bioeconomy Information Sharing and Analysis Center (BIO-ISAC), Fairfax, Virginia, *USA*	whitney@isac.bio ORCID

We have placed enormous demand on the bioeconomy; are we prepared to defend it? Advancements in biomanufacturing and biotechnology drive the science we need to thrive, everything from apples to vaccines. Cyberbiosecurity is safety and security when working with digital systems and biology. These bio-connected systems face unique hazards and advanced impacts should the worst imaginable day become a reality. The current state of global cyberbiosecurity defence has left these systems exposed and available to our adversaries. Focusing on a handful of incidents and research from the last three years, BIO-ISAC will demonstrate the connectivity between industry, systems and threats in agriculture. Following the review, we will detail what policy makers, individuals and organisations can do about this issue through information sharing and the use of cyberbiosecurity hygiene principles.

If you require immediate support for your facility or project, please do not hesitate to email help@isac.bio for assistance. All information is kept confidential.

Keywords:
Bioeconomy, Biotechnology, Cyberbiosecurity, Cybersecurity, Digital biosecurity.

Session 5.5
Turning Threats into Threat Reduction

Date & Time	Author
Wednesday 29 October 09:00 – 10:30	Co-Chair of the Global Partnership Against the Spread of Weapons of Mass Destruction, CBRN Working Group, *United Kingdom*

The international community of chemical and biological weapons threat reduction experts spend much of their time worrying. Worrying about how to tackle threats, worrying about how to deliver more effective threat reduction activity, and worrying about how to get ahead of the next problem on the horizon.
New and emerging technologies, such as artificial intelligence (AI), synthetic biology (synbio) and quantum technologies (QT), can deepen those worries. Each have the potential to evolve and complicate existing and well-known chemical and biological weapons related risks. The rate at which such technologies are advancing presents a significant challenge to policymakers and our established tools for tackling these weapons.

But what if those very technologies turn out to be part of the solution to, rather than the cause of, our worries? Though the dual-use nature of AI, synbio and QT makes them a complex and challenging threat to tackle, it does present us with opportunities. Opportunities to take the very benefits these technologies offer society and apply them to our own threat reduction efforts. Might such technologies be used to enhance early-warning systems to detect chemical and biological threats, and identify patterns and anomalies indicative of Weapons of Mass Destruction (WMD) production? Or might they support our international conventions and arms control architecture, by improving the effectiveness and efficiency of verification methods, increasing our education reach, or helping us to tackle disinformation?

This presentation will explore the practical opportunities we may have ahead of us to positively exploit new technologies. It will build on the work done to date by the Global Partnership's CBRN Working Group, including most recently at a Wilton Park event: *The Good, The Bad and The Actionable: a Global Partnership Initiative to Counter and Leverage WMD Relevant Technologies.* This event brought together the Global Partnership and technology community to collaborate on practical and deliverable methods of using emerging technologies to enhance global threat reduction efforts. The presentation at this conference will broaden this call to action, to enable the chemical and biological weapons threat reduction community to realise the same profound benefits experienced in other sectors.

Keywords:
Artificial intelligence, Global partnership, WMD threat reduction.

References:

[1] Wilton Park. Report: the good, the bad, and the actionable: a global partnership initiative to counter and leverage WMD relevant technologies. Steyning (United Kingdom): Wilton Park; 2025. 13 p. Available at: https://www.wiltonpark.org.uk/app/uploads/2025/05/WP3612-Final-Report.pdf (accessed on 21 October 2025).

[2] Global Partnership Against the Spread of Weapons and Materials of Mass Destruction. Homepage. Available at: https://www.gpwmd.com (accessed on 21 October 2025).

Session 6
Sustainable Laboratories

Session 6.1

The Biosafety Research Roadmap: Building Evidence to Support Risk Management

Date & Time

Wednesday 29 October
11:00 – 11:15

Authors

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Biosafety is the implementation of containment and control measures to reduce the potential for release of pathogens from the microbiology laboratory. Global biosafety practices are based on guidelines initially developed in the 1980s and revised regularly since. In recent years there have been major changes in the technologies used in the microbiology laboratory and in the containment technologies used to prevent release. There has also been an expansion in the number of laboratories handling pathogens. It has also become clear that the evidence basis backing up biosafety measures is lacking.

To understand these issues and to identify gaps in the biosafety evidence base, a Biosafety Research Roadmap Technical Working Group was formed by WOAH, WHO and Chatham House led by Professor Stuart Blacksell of Oxford University. The working group was made up of 16 global biosafety specialists with representatives from every continent. The group determined a list of agents to study in detail and then carried out a literature review of the evidence base for the biosafety measures taken in microbiology laboratories with each agent.

The results of these reviews were published in *Applied Biosafety* and a review of laboratory acquired infections and escapes were published in *Lancet Microbe.*

The development of evidence-based measures for biosafety facilitates the development of efficient, economic and sustainable laboratories. However, the evidence base first needs to be improved. For this purpose, the BioPrevail initiative has been launched; BioPrevail allows the exchange of biosafety information and has recently launched a funding initiative to determine better ways of creating a biosafe-built environment for diagnostic laboratory.

Session 6.2

A Deep Dive into Sustainable Laboratory Programming, Design, Construction and Operations: Benchmarking Candidate Facilities to Establish 'What does work, and what does not work' in Low- and Middle-Income Countries

Date & Time

Wednesday 29 October
11:15 – 11:30

Authors

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Pond and Company and AFMS International were appointed by Global Affairs Canada in conjunction with the support of BioPREVAIL to carry out 'a deep dive' into benchmarking and fact finding of laboratories within LMIC. The countries identified were Thailand, Laos PDR, Kenya, Tanzania and Morocco. The initiative was broken down into three tasks.

Task 1 is a collective and comprehensive list of issues that include Organisational/ Operational, Technological and Environmental topics, but with a primary focus on issues of engineering and maintenance concern.

Task 2 is to develop a quantification of the items and issues identified in Task 1.

Task 3 is Facility Benchmarking.

This stage of the project is to evaluate current diagnostic laboratories, preferably BSL3, to understand the operational and maintenance challenges. Essentially, this stage of the project is *Problem Identification*. The forthcoming stages of the project will take the information gathered to develop Solutions. The evaluation will focus on identifying and analysing the systems, components and conceptual

frameworks that define the foundational principles of biocontainment laboratory operations. These elements must be aligned and interoperable with the Standard Operating Procedures (SOPs) established for each individual laboratory.

Visits were coordinated to assess the facilities and discussions with the staff about their challenges and their efforts in sustaining their labs. Prior to each lab assessment a questionnaire was required to be completed to highlight the background and challenges that the staff in these facilities face on a daily basis. We were tasked to identify the operational, technical and organisational challenges each lab experiences, to develop and quantify their challenges, and to determine if the challenges they faced were similar to those of other regions within the global laboratory networks in LMIC.

Keywords:
Benchmarking, Biocontainment, Challenges, Maintainability, Problem identification, Sustainability.

Session 6.3
The BioPREVAIL Built Environment Design Challenge

Date & Time	Author	
Wednesday 29 October 11:30 – 11:50	**Lisa Elaine McDonald** Global Health Security Fund, Switzerland	lisa@ghsfund.org ORCID

Biological Preparedness and Resilience through Evolution and Innovation of Laboratories (BioPrevail) is a One Health Security innovation initiative for sustainable laboratories. Diagnostic containment laboratories play a critical role in global efforts to prevent, detect and respond to dangerous pathogens. Frequently, when these facilities are constructed in resource-constrained settings, they are poorly suited to operate as intended and face constant challenges. When diagnostic containment laboratories fail to operate sustainably, they pose a multifactorial risk to global health security. BioPrevail was launched in early 2024 and built upon decades of efforts targeting sustainable labs. An extensive stakeholder analysis was performed, which culminated in the launch of the BioPrevail virtual innovation ecosystem platform in November 2024. This platform hosted the first BioPrevail Design Challenge with the goal of identifying solutions that improve the built environment of diagnostic containment laboratories. Applications were accepted from 28 July to 31August 2025. A total of 66 submissions from 31 countries were received addressing at least one of three thematic areas (facility design, equipment maintenance and waste management). Following screening for relevance and completeness, 41 submissions passed through to the evaluation and judging phase. Interviews were conducted with 24 teams to determine the development status of the solution and suitability for the design challenge format. Nine teams were then invited to take part in an intensive six-month programme comprised of a three-month development period followed by a three-month pilot period. The teams represented geographic and demographic diversity, with 7 countries represented and 44.4% of teams led by female primary investigators. Teams are supported in a variety of ways over the course of the programme including financial support for the development and pilot phases and technical mentorship that is coordinated through a lead mentor assigned to each team to assist in accessing expertise and resources on the

virtual innovation ecosystem platform. Following a required virtual innovation training programme, teams will convene in-person to present preliminary results from the development phase of the programme in December 2025.

Keywords:
Biosecurity, Design, Diagnostic containment laboratory, Health security, Innovation, Investment, One Health, Sustainability, Technology.

Session 7
Advances in Surveillance and Diagnostic Technologies for Biological Threat Reduction

Session 7.1
Strengthening One Health Security Through Smarter Biosurveillance

Date & Time	Author	
Wednesday 29 October 14:00 – 14:15	**Ekta Patel** International Livestock Research Institute (ILRI), Nairobi, *Kenya*	e.patel@cgiar.org ORCID

Governments increasingly view pandemics and zoonotic spillovers as national security issues, and early warning systems for biological threats are now central to many health security agendas. What remains missing are the linkages of a fully integrated system. Robust biosurveillance begins with how and where we collect samples, because security depends on the earliest possible signal of risk. In a world where pathogens move freely across borders, outbreaks can quickly destabilise societies, economies and national security, reminding us that our scientific responses must also transcend borders. Surveillance must therefore be understood as a security function, not only a scientific one. A One Health perspective highlights this reality: protecting people, animals and environments requires integrated surveillance capable of anticipating, detecting and containing biological risks before they escalate.

The challenge is aligning surveillance with security objectives. Each objective, be it detecting emerging pathogens early, demonstrating freedom from regulated animal diseases, or attributing a deliberate release, requires distinct sampling strategies. Surveillance, including sampling and data collection, that is poorly matched to its objective creates vulnerabilities, while well-targeted sampling strengthens regulatory credibility, supports trade, and provides assurance to domestic and international partners.

This talk will explore innovations in targeted, risk-based, sentinel, and environmental sampling that transform surveillance into an active defence tool. New technologies such as portable sequencing, environmental DNA sampling and digital traceability improve not only scientific accuracy but also core security outcomes: faster detection of anomalies, stronger situational awareness for decision-makers, and greater resilience in the face of natural, accidental, or intentional biological threats. By generating actionable data at the human–animal, environment interface, these advances aim to close gaps between science and security practice.

The conclusion: smarter, faster, and more representative sampling that strengthens One Health security by turning surveillance into the first line of defence. When technological innovation is matched to regulatory and operational needs, surveillance provides governments and institutions with what they most need in a crisis: timely, evidence-based information that enables decisive action to prevent biological risks from becoming biological crises.

Keywords:
Biosecurity, Detection, Early warning, One Health security, Surveillance.

Session 7.2
Optimising Use of Next Generation Sequencing for One Health Biothreat Reduction

Date & Time	Author	
Wednesday 29 October 14:15 – 14:30	**Samuel Yingst** Columbia University Global Alliance for Preventing Pandemics, Cape Town, 7806, *South Africa*	sy3229@cumc.columbia.edu ORCID

Data to action in public health increasingly depends on use of next generation sequencing (NGS). Both in the interest of the One Health paradigm and to assure cost effective surveillance for non-zoonotic disease in the context of food security and trade, the veterinary sector should aggressively pursue selective use of NGS. NGS is not a panacea – the tool must be integrated into diagnostic networks through a process of cost-benefit analysis and optimisation. Optimisation is required both in terms of selection of the use cases for NGS and of the NGS method itself. Deliberate adoption of NGS can achieve the One Health vision and can enable biosecurity in all its manifestations.

Keywords:
Capture sequencing, Diagnostic network optimisation, Genomics, Genomic signatures, Next generation sequencing, Virome.

References:

[1] Kapoor V, Briese T, Ranjan A, Donovan WM, Mansukhani MM, Chowdhary R, *et al.* Validation of the VirCapSeq-VERT system for differential diagnosis, detection, and surveillance of viral infections. J. Clin. Microbiol. 2024;62(1):e0061223. https://doi.org/10.1128/jcm.00612-23

[2] Koné A, Kané F, Neal A, Konate I, Coulibaly B, Dabitao DK, *et al.* Adding virome capture metagenomic sequencing to conventional laboratory testing increases unknown fever etiology determination in Bamako, Mali. Am. J. Trop. Med. Hyg. 2024;112(3):626-35. https://doi.org/10.4269/ajtmh.24-0449

[3] Moonga LC, Chipinga J, Collins JP, Kapoor V, Saasa N, Nalubamba KS, *et al.* Application of a sensitive capture sequencing approach to reservoir surveillance detects novel viruses in Zambian wild rodents. Viruses. 2024;16(11):1754. https://doi.org/10.3390/v16111754

[4] Romano ER, Sleeman K, Hall-Eidson P, Zeh C, Bhairavabhotla R, Zhang G, *et al.* Contribution of PEPFAR-supported HIV and TB molecular diagnostic networks to COVID-19 testing preparedness in 16 countries. Emerg. Infect. Dis. 2022;28(13):S59-68. https://doi.org/10.3201/eid2813.220789

Session 7.3

Faster, Smarter, Stronger: How Advances in Artificial Intelligence Can Transform Multisectoral Readiness and Resilience to Global Biological Threats

Date & Time

Wednesday 29 October
14:30 – 14:45

Authors

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Global biological threats are increasing in frequency, scale, and impact at a time when systems to counter them are in decline. Preventing or mitigating the impacts of biological threats is contingent upon their early detection, timely assessment of their differential local, regional and global risks, and effective translation of sector and persona-specific actionable insights into coordinated, multisectoral actions. Rapid advances in artificial intelligence (AI) are fundamentally transforming our ability to strengthen these core functions.

In our organisation, large language models (LLMs) are leveraged to increase the global breadth, depth and speed at which emerging global biological threats to humans and animals are identified, across natural, accidental or deliberate origins. When integrated with human subject matter expertise, biothreat surveillance is

enhanced through iterative cycles of supervised machine learning, while human subject matter oversight that is free from political influence engenders trust among end-users.

AI models are also utilised to quickly and efficiently identify anomalous biological threats that demand closer attention. Spatiotemporal analytics can rapidly identify threats that appear in global locations that are unexpected, at times of year that are unexpected, at scales that are unexpected, and/or with clinical features that are unexpected, potentially signalling changes in pathogens, their mode(s) of transmission, and/or the immunity of affected populations. Big data analytics are being harnessed to characterise the differential nature of risk across world geographies that are interconnected through the mass global movements of human and animal populations (and hence pathogens). Generated localised insights empower decision-makers to mobilise actions that are commensurate with the risks at hand, while avoiding over- or under-reaction, each of which is accompanied by health, economic and/or social consequences.

Advances in natural language generation are also being used to efficiently communicate insights that are readily understandable and actionable across a wide range of personas and sectors, creating new opportunities for cross-sectoral collaboration and geographic coordination. These emerging capabilities can preserve valuable time, empower actions that are locally contextualised and personalised across countless permutations of geographies, languages, sectors and personas, in service of strengthening readiness and resilience to present inevitable future biological threats.

Keywords:
Artificial intelligence, Disease surveillance, Epidemic modelling, Health security, Knowledge translation, One Health, Pandemic preparedness.

Session 7.4

Attribution of a Biological Animal Health Event using Diagnostic and Surveillance Data

Date & Time

Wednesday 29 October
14:45 – 15:00

Authors

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Background: Determining whether emerging pathogens arise from natural spillover or deliberate manipulation remains one of the most urgent and unresolved challenges in biosecurity. Current genomic approaches remain narrowly focused on genetic similarity and phylogenetic placement. While powerful for outbreak tracking, these methods are poorly suited to resolving questions of intent or manipulation.

Methods: We developed a forensic genomics framework that integrates six independent layers of evidence: 1) mutational signatures of host-driven editing, 2) evolutionary timelines based on molecular clock and recombination models, 3) immune profiling through predicted HLA-I and HLA-II epitope coverage, 4) functional coherence of protein domains and structural motifs, 5) digital provenance from sequence metadata and laboratory vector libraries, and 6) epidemiological and ecological context link genomes to outbreak timing, geography, and plausible reservoir and environmental comparators. Each layer contributes to a composite attribution profile, reducing reliance on any single signal.

Results: Applied to test cases, natural genomes demonstrated editing marks expected from host-driven process (e.g. APOBEC) and showed steady accumulation of mutations, while engineered constructs often contained

improbable recombination junctions and unexplained losses of immune recognition sites. Integrating layers consistently improved confidence in attribution benchmarked against traditional methods.

Case Application: Applied to the 2025 Ebola outbreak in Kasai, the framework revived a longstanding hypothesis: that Ebola may persist in its reservoir host in a 'latent' state, explaining why the new strain was genomically proximate to the virus first detected in 1976. This demonstrates the value of layered forensic genomics for opening new investigative directions.

Discussion: By embedding molecular, evolutionary, immunological and digital signals into a framework, this approach mirrors the logic of traditional forensics – where multiple evidence types build a stronger case than any one alone. It offers a path toward attribution standards that are scientifically transparent, operationally usable, and defensible in legal contexts.

Keywords:
Attribution, Biosecurity, Diagnostics, Forensic genomics, Surveillance**

Session 8
Sustainable Approaches in Emergency Management

Session 8.1
Occurrence and Eradication of Foot and Mouth Disease Response in Slovakia

Date & Time	Author
Wednesday 29 October 16:00 – 16:25	**Dr Martin Chudy** Chief Veterinary Officer, State Veterinary and Food Administration of the Slovak Republic, *Slovakia*

After confirmation of a foot and mouth disease (FMD) outbreak in Hungary on 6 March 2025, located 3 km from the Slovak border, the relevant local Veterinary Administration immediately implemented veterinary measures for municipalities, breeders and hunting associations in the demarcated zones (3 km and 10 km) in line with national and EU legislation.

After more than 50 years, on 21 March 2025, three FMD outbreaks were officially confirmed in Slovakia, all in the district of Dunajská Streda. In total, six outbreaks were confirmed between March and April 2025, all in cattle holdings.

The National Disease Control Centre (NDCC) was activated in the capital city, Bratislava. Emergency measures were issued by the Slovak Chief Veterinary Officer, binding across the entire territory of Slovakia under the national Veterinary Care Act, and included numerous restrictions.

In all outbreaks, stamping out started as soon as possible. Emergency suppressive vaccination was carried out in five of the six outbreaks. The chosen vaccination strategy aimed to suppress or reduce the spread of the virus among susceptible animals on the affected holding or epidemiologically linked premises. A total of 8,341 cattle were culled on commercial farms under the supervision of official veterinarians. Carcasses of culled or deceased animals and animal by-products were either disposed of by incineration in an approved disposal facility or buried under supervision of official veterinarians.

In the protection and surveillance zones of the outbreaks, a census of holdings keeping susceptible animals was carried out, and animals sampled for PCR testing for FMD. Sampling and testing in free areas were conducted in farms where animals displayed suspicious clinical signs. Samples were also taken prior to the movement of animals to the designated slaughterhouse, within 48 hours prior to transport, and movement was only permitted after favourable test results were received.

Critical points identified included the quality of the emergency plan, outbreak depopulation procedures, methods of culling animals, movement restrictions within zones and nationwide, contact farms and preventive culling, financing, communication to different bodies, and the legal basis for adoption of the measures.

Slovakia asked WOAH on 26 September 2025 for the recovery of the former status of the whole territory as a country free from FMD where the vaccination is not practised.

Keywords:
Eradication of outbreaks, Foot and mouth disease, Measures, Restriction, Vaccination.

Session 8.2

Lessons in Foot and Mouth Disease Response from Hungary Intergovernmental Crisis Management in Case of a Transboundary Animal Health Emergency

Date & Time	Author
Wednesday 29 October 16:00 – 16:25	**Dr Lajos Bognár PhD** Senior Advisor, Ministry of Agriculture, *Hungary* lajos.bognar@am.gov.hu

Foot and mouth disease (FMD) occurred in Hungary in March 2025, after more than 50 years of freedom. A total of five FMD outbreaks were confirmed between 6 March and 17 April 2025. All outbreaks occurred on large-scale dairy farms.

In line with the relevant EU and national legislation, official restrictions were ordered immediately upon the suspicion of FMD in all outbreaks. Emergency suppressive vaccination was carried out in four of the five outbreaks. These animals were vaccinated as well as culled on site. Direct-contact holdings were identified in three outbreaks, and these holdings were preventively culled. Protection zones of 3km and surveillance zones of 10km were established around the affected holdings. An additional restricted zone was established after the second outbreak and was enlarged later due to the fifth outbreak. All measures were carried out in the restricted zones without any derogations. These included culling on site as well as safe disposal, movement ban on all non-safe commodities, ban on restocking, markets, shows, etc.

The most important goal was to minimise the risk of further spread of the disease. Therefore, further measures were gradually ordered in the restricted zones. These included bans on transit, hunting and grazing, as well as compulsory closed keeping of animals.

Extensive tracing was conducted to identify contact holdings via movement of personnel, animals, goods, vehicles, etc. These contact holdings were all examined and sampled, with negative results confirmed.

The implementation of these necessary measures required coordination beyond the Veterinary Services. A strict command chain and continuous communication between six governmental bodies were established immediately after the first outbreak. Continuous information exchange with authorities of the neighbouring countries is essential in crisis situations.

Hungary regained its WOAH free status without vaccination on 10 September 2025.

Keywords:
Foot and mouth disease, Measures, Outbreaks, Restricted zone.

Session 8.3
The Livestock Industry in Emergency Management: Poultry Sector Views

Date & Time	Author
Tuesday 28 October 16:25 – 16:40	**Nicolò Cinotti** Secretary General, International Poultry Council (IPC), *United States of America* nicolo@internationalpoultrycouncil.org

The livestock sector plays a critical role in global food security, trade and public health, making it highly vulnerable to biological threats. These threats, whether naturally occurring, accidental or deliberate, can severely disrupt production, compromise animal welfare, undermine consumer trust, and destabilise economies. Historical outbreaks such as avian influenza (HPAI) and African swine fever (ASF) illustrate the far-reaching consequences of livestock diseases, from mass culling and border closures to market instability and public panic.

Within this context, the poultry industry provides a compelling case for understanding and managing risks through a One Health perspective, recognising the interconnectedness of animal, human and environmental health. Key concerns include zoonotic potential, transboundary spread, and emerging risks such as antimicrobial resistance (AMR) and influenza strains. These issues require coordinated responses that integrate national, regional and global perspectives, engaging stakeholders from governments, academia and the private sector.

The poultry sector has developed a framework for industry action emphasising clear roles and responsibilities across governance levels, leveraging industry resources, and enhancing preparedness. Core strategies include comprehensive risk analysis, strong regulatory processes, traceability in animal sourcing, surveillance and laboratory testing, effective interventions such as biosecurity and vaccination, and investment in veterinary infrastructure and education.

Public–private collaboration emerges as a central theme, offering lessons in information sharing, joint research and development, emergency preparedness, and financial resilience. Integrated surveillance systems, genomic data sharing, and collaborative networks enhance early detection and response. Joint research and development accelerates vaccine and diagnostic innovation, while emergency funds, subsidies and insurance mechanisms safeguard producers against economic collapse. Capacity building, through training, simulation exercises and knowledge exchange, ensures long-term resilience across both public and private actors.

Ultimately, the sector must focus on three imperatives: preparing during times of peace by building robust frameworks; collaborating transparently across national and international boundaries; and responding swiftly and effectively when crises occur. These coordinated efforts are essential to protect animal health, ensure food security, and maintain consumer confidence in the face of evolving biological threats.

Keywords:
Biosecurity, Livestock, One Health, Poultry industry, Public-private collaboration.

Session 8.4
Renforcer la résilience face aux maladies transfrontalières au Tchad

Date & Time

Tuesday 28 October
16:40–16:55

Auteurs :

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Le Tchad, pays sahélien limitrophe de six États, est un vaste territoire d'une superficie de 1 284 000 km2. En plus de l'immensité du territoire et de sa position continentale, le Tchad se place comme un pays d'élevage avec un cheptel estimé à 137 664 217 de têtes toute espèce confondue selon le Recensement Général de l'Élevage de 2015 et disposant d'un système d'élevage largement basé sur le pastoralisme itinérant, la transhumance et le commerce d'animaux sur pied. La porosité des frontières, combinée aux insuffisances en ressources humaines, matérielles et financières des Services vétérinaires, accroit la vulnérabilité du cheptel face aux maladies transfrontalières telles que la peste des petits ruminants (PPR), la péripneumonie contagieuse bovine (PPCB), la fièvre aphteuse, la dermatose nodulaire contagieuse, etc.

Ainsi depuis 2008, le Tchad s'est engagé dans une dynamique d'amélioration des Services vétérinaires par la réalisation de plusieurs missions d'évaluations (PVS Gap) avec l'outil PVS de l'Organisation mondiale de la santé animale (OMSA) ayant permis d'identifier des priorités et de formuler des recommandations.

Sur cette base, le Projet Régional d'Appui au Pastoralisme financé par la Banque mondiale, le Comité international de la Croix rouge, la FAO, la Coopération suisse à travers le Programme de renforcement de l'élevage pastoral (PREPAS) et bien d'autres partenaires techniques appuient la mise en œuvre de stratégies de santé animale ciblant notamment la vaccination de masse contre les maladies prioritaires, le renforcement des capacités des acteurs et la coordination transfrontalière. Les résultats montrent une amélioration de la couverture vaccinale avec un cumul d'environ 40 millions de petits et gros ruminants vaccinés depuis 2022, des infrastructures vétérinaires construits et réhabilités (parcs de vaccination et postes vétérinaires), du personnel vétérinaire et para vétérinaire formé, une détection plus rapide des foyers et une meilleure implication des communautés. Toutefois les défis persistent : à savoir l'insécurité, le faible accès aux zones reculées, l'insuffisance des infrastructures vétérinaires et les ressources limitées.

Le Tchad plaide pour la mutualisation des ressources régionales et l'intégration des interventions de santé animale dans les mécanismes de résilience face aux crises.

Mots clés :
Maladies transfrontalières, Pastoralisme, Résilience, Santé animale, Services vétérinaires, Surveillance épidémiologique, Transhumance.

Références :

[1] Ministère de l'Élevage et des Productions Animales (Tchad). Plan national stratégique d'éradication de la peste des petits ruminants. N'Djaména (Tchad) : Ministère de l'Élevage et des Productions Animales ; 2022. 94 p.

[2] Ministère de l'Élevage et des Productions Animales (Tchad). Plan national de formation des Services vétérinaires. N'Djaména (Tchad) : Ministère de l'Élevage et des Productions Animales ; 2022. 62 p.

[3] Direction Générale des Services Vétérinaires (Tchad). Rapport annuel 2024. N'Djaména (Tchad) : Direction Générale des Services Vétérinaires ; 2024. 44 p.

[4] Organisation mondiale de la santé animale (OMSA). Rapport préliminaire d'analyse des écarts PVS – Tchad. Paris (France) : OMSA ; 2024.

Session 8.5

A One Health Transboundary Simulation Exercise in Jordan and Iraq

Date & Time

Tuesday 28 October
16:55 – 17:10

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The One Health Systems Transboundary Assessment for Priority Zoonoses (OHTAPZ) tool was developed to address the need for a multisectoral approach in assessing transboundary zoonotic disease threats within and across shared land borders [1,2]. OHTAPZ and a newly developed OH Point of Entry (POE) Checklist [3] were used to assess OH capacities within and between Jordan and Iraq culminating in a transboundary multisectoral simulation exercise. The

development, implementation and evaluation of the Simulation Exercise (SimEx) followed an iterative process: 1) identifying the stakeholders required for planning, exercise and evaluation; 2) selecting a priority transboundary zoonotic disease (TZD) from the bilateral list of priority TZDs; 3) selecting OH competencies to be tested at each POE; 4) developing the exercise, including planned scenarios for Crimean-Congo Hemorrhagic fever (CCHF); 5) finalising logistical preparations; 6) conducting the exercise and live evaluation; and 7) capturing feedback and key findings through an After Action Review (AAR). This SimEx was the first bilateral assessment of OH capacities at and across formal land borders in both nations representing collaborations across human health, animal health, and agricultural, environmental and border security sectors. Implementation of the SimEx not only evaluated core OH competencies identified through the OH POE Checklist, but it also met SimEx recommendations under WHO's International Health Regulations and WOAH's Performance of Veterinary Services Pathway, therefore supporting compliance under two international health frameworks for each country. Planning, implementation and evaluation of the multisectoral, transboundary SimEx assessed and verified current OH preparedness and response communication and coordination mechanisms within and between the POEs during a TZD event in real-time and supported the integration of OH approaches into SimEx methodology. The AAR provided stakeholders with an opportunity to discuss how to improve POE operations and actionable next steps and future considerations for SimEx scenario development.

Keywords:
After action review, Border health, Global health security, Iraq, Jordan, One Health, Points of entry, Simulation exercise, Transboundary zoonotic diseases, Transdisciplinary collaboration.

References:

[1] Nagar A, Linder AG, Fogarty AS, Vahey RA, Wakefield B, Hogan KM, *et al.* Findings from a disease prioritization and tabletop exercise to evaluate transboundary One Health capacities between Jordan and Iraq. BMC Glob. Public Health. 2025;3(1):66. https://www.doi.org/10.1186/s44263-025-00183-5

[2] Miller LN, Saadawi WK, Hamouda WB, Elgari AS, Abdulkarim EA, Lmrabet AMM, *et al.* Assessing One Health capacities for transboundary zoonotic diseases at the Libya-Tunisia border. One Health Outlook. 2024;6(1):3. https://www.doi.org/10.1186/s42522-024-00101-z

[3] Linder AG, Hogan KM, Sorrell EM. One Health POE checklist for transboundary zoonotic disease preparedness. Baltimore (United States of America): Johns Hopkins Research Data Repository; 2025. https://doi.org/10.7281/T1N1YCKS

Poster Abstracts

Building One Health Security Through Waste Surveillance and Wildmeat Value Chains

Date & Time	Authors
Tuesday 28 October 18:20	**Ekta Patel, Bernard Bett** *et al.*, ILRI

Strengthening animal health systems is central to global health security, serving as the first line of defence against pandemics, antimicrobial resistance (AMR), and other biological threats.

At the International Livestock Research Institute (ILRI), scientists and partners are advancing innovative approaches that bridge animal, human, and environmental health, contributing to the vision of a One Health security framework. In East Africa, ILRI has adapted wastewater-based epidemiology into **animal waste surveillance**, using abattoir samples to generate early warning signals for transboundary pathogens. Studies in Kenya revealed resistant genes circulating across livestock, wildlife, soil and water, demonstrating that resistance is not confined to clinics but moves silently across ecosystems.

ILRI has also advanced **genomic tools for Rift Valley fever (RVF)**, including lineage assignment technologies and ecological monitoring that link rainfall, mosquito dynamics, and livestock movements to outbreaks. These tools enable rapid detection and informed interventions, preventing large-scale human and livestock impacts.

Finally, ILRI's work with partners on **wildmeat trade and consumption** highlights an underappreciated dimension of biological risk. Informal and transboundary wildmeat value chains can serve as conduits for zoonotic spillovers, with implications for global border security. Addressing these risks requires a sensitive approach—balancing global health security priorities with respect for local livelihoods, cultural norms and traditions—while also strengthening systems that monitor and manage cross-border disease threats.

Together, these innovations illustrate how investments in animal health directly contribute to biological threat reduction, advancing One Health security that protects both regional communities and global populations.

Swiss Biorisk Alliance: a One Health Platform for Detecting, Preventing and Managing Biological Risks from Communicable Diseases

Date & Time

Tuesday 28 October
18:20

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Swiss Biorisk Alliance Secretariat

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A health crisis such as the COVID-19 pandemic requires a whole range of expertise, practical experience and infrastructure from different disciplines and sectors. However, there is usually not enough time during an acute crisis to identify the relevant key players, establish connections and facilitate collaboration.

With the Swiss Biorisk Alliance, we address this issue by setting up a national platform with international reach that brings together the relevant stakeholders in advance of a crisis. In this way, we want to contribute to the more efficient prevention, detection and mitigation of biological risks posed by infectious diseases, both from natural sources and accidental or intentional release.

In line with the One Health approach, we strive to integrate the human, veterinary and environmental fields and connect the public, private and non-profit sectors. Since its establishment in 2023, our network has grown considerably and now comprises over 35 institutions, including research institutions, government bodies, animal and human healthcare providers, diagnostic laboratories, pharmaceutical companies, as well as expert committees, associations and networks concerned with various aspects of infectious diseases. Together, we are working to establish ways to collaborate within our network and with additional partners, both outside of and during a crisis, with a current focus on detection, especially diagnostic, and prevention, especially vaccines. An initial outcome is the creation of a yearly symposium to facilitate knowledge sharing and mutual learning across disciplines and sectors, thereby building a community that reaches beyond the network's members. Furthermore, the Swiss Biorisk Alliance has recently been tasked with leading the development of guidelines for risk reduction in facilities that handle biological agents, particularly those that pose a potential for major accidents or large-scale consequences.

Enhancing Biological Risk Management for Field Animal Health Service Providers in Kenya

Date & Time	Authors
Tuesday 28 October 18:20	**B.S. Muasa, M.R. Ndanyi, A.A. Manyola, N.N. Mulwa, P. Wamboi, S.N. Wekesa, A.K. Sangula, A.E. Azegele** Directorate of Veterinary Services, Nairobi, *Kenya*

Field animal health service providers in Kenya frequently handle high-risk biological materials from zoonotic and transboundary diseases, which pose a risk not only to themselves but also to the wider environment. However, many of these practitioners operate in resource-limited settings where access to protective equipment, training and infrastructure is often inadequate.

The lack of standardised field biorisk management (BRM) practices increases the risk of pathogen spread, accidental or intentional exposure that could have catastrophic consequences not only for human and animal health, but also impact on the trade of animals and animal inputs and products.

In March 2025, the Directorate of Veterinary Services, in partnership with The World Organisation for Animal Health (WOAH), initiated the development of National Bio-Risk Management Guidelines for Field Animal Health Service Providers. This initiative was undertaken under the Fortifying Institutional Resilience Against Biological Threats (FIRABioT) Project, with support from Global Affairs Canada.

The development followed a participatory approach, with one session drafting the guidelines and a second validating them. Stakeholders were drawn from the National and County laboratory and field veterinary services, veterinary and animal health training institutions, the Kenya Veterinary Board, the Kenya Veterinary Association, Kenya Wildlife Service, Kenya Defense Forces, National Disaster Operation Center, National Disaster Management Unit, National Public Health Institute, animal health service providers, research institutions, and industry experts.

The outcome was the development of national biorisk guidelines that protect practitioners and communities while reducing spillover risks. Embedding biosafety in routine field practice demonstrates Kenya’s commitment to reducing biological threats and enhancing global resilience.

Enhancing Biological Risk Management for Field Animal Health Service Providers in Kenya

Date & Time	Authors
Tuesday 28 October 18:20	**Phoebe K. Readford, J.T. Paulley, Caitlin J. Holley, Renata Polotnianka** Commonwealth Scientific and Industrial Research Organisation, Australian Centre for Disease Preparedness, Geelong, *Australia*

The Commonwealth Scientific and Industrial Research Organisation's Australian Centre for Disease Preparedness (ACDP) is a high-containment laboratory at the forefront of cutting-edge technologies to combat emerging infectious diseases. ACDP delivers a range of regional and global initiatives, which are designed to build networks, promote collaboration and strengthen knowledge to combat current and future biological threats. Two examples of these activities – Regional Biorisk Management Training (R-BMT) and twinning projects – are outlined.

The R-BMT project strengthens biorisk management systems in Asia and the Pacific through targeted training of laboratory leaders and creating a community of biorisk practitioners. Training comprises two courses:

1. Introduction to Biorisk Management
2. Biorisk Management Leadership.

R-BMT strengthens global health security by reducing the likelihood of laboratory-acquired infections, inadvertent or deliberate release of biological material and strengthening the response to infectious disease outbreaks.

ACDP's Biorisk Management Group has partnered in the Asia-Pacific region to support facility twinning projects focused on the development of robust biorisk management frameworks to address critical needs and support continual improvement in biosafety and biosecurity. This has extended into participation in the global webinar series on biosafety and biosecurity and provides the platform for continual guidance and assistance. Current advanced applied biosafety courses focusing on facility management and maximum containment laboratory use and maintenance offer an avenue for regional partners to learn the technical skills required to meet their needs.

Through the building of these networks and sharing of expertise across the Asia and the Pacific region and globally, ACDP contributes to national, regional and international health security.

Pioneering One Health Epidemic Threat Intelligence in Complex Settings (POETICS)

Date & Time

Tuesday 28 October
18:20

Authors

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Epidemics do not arise in isolation; they are shaped by converging social, ecological, and political dynamics that traditional surveillance systems are ill-equipped to capture. Sites of deep uncertainty such as conflict-affected and fragile settings, are both key sites of epidemic emergence and locations in which intelligence is fragmented, siloed, or absent. However, existing tools are primarily rooted in stable health systems and struggle to counter the multidimensional epidemic threats and vulnerabilities across human, animal, and plant health in volatile, uncertain, complex and ambiguous (VUCA) settings.

Pioneering One Health Epidemic Threat Intelligence in Complex Settings (POETICS) is an ambitious programme proposing to develop, test and deploy a proof-of-concept international transdisciplinary early warning system (EWS) for epidemic threats emerging from VUCA environments. Rather than relying solely on pathogen-specific data or linear surveillance chains, the POETICS approach fuses diverse data streams, including epidemiological, veterinary, ecological, behavioural, meteorological and political insights into a unified decision-making framework.

POETICS contains three key innovations: Intelligence Fusion for Epidemic Risk, Deep Uncertainty Modelling, and Co-Creation and Policy Integration to redefine an EWS in VUCA contexts. We aim to explore the triangulation of emerging technologies such as AI and LLMs for use with high-variance, multi-format data,

red-teaming and structured scenario development, and the operational integration of community-based intelligence alongside remote sensing and laboratory surveillance to inform decision-making by policymakers, practitioners and civil society. Our goal is to inform the evolution of epidemic preparedness strategies with new evidence and institutional models while establishing equitable research partnerships and mutual capacity-building.

Improving Global Access to External Quality Assessment Programmes for the Laboratory Detection of Emerging and High-Threat Pathogens

Date & Time

Tuesday 28 October
18:20

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External Quality Assessment (EQA) is a vital component of laboratory quality management and a key indicator of diagnostic preparedness for epidemic and pandemic-prone diseases. However, a landscape analysis of EQA programmes (EQAP) and the conclusions of a global consultation with key stakeholders held in June 2025 revealed that laboratories' access to and provision of EQAP for many high-threat pathogens – such as viral haemorrhagic fevers and high-risk bacteria – currently remains limited due to logistical, regulatory and financial constraints.

In response, the World Health Organization (WHO) is establishing a Global Forum for Providers of External Quality Assessment Programmes for Emerging & High-Threat Pathogens (PEQAP). The forum will foster multi-sectoral partnerships bringing together national public health laboratories, academic institutions, NGOs, dedicated EQA providers, and other actors involved in laboratory capacity building. PEQAP will serve as a collaborative platform to share experiences, propose actions, and support the development of sustainable EQAP for emerging and high-threat pathogens. It aligns with WHO's broader diagnostics initiatives under World Health Assembly Resolution 76.5 and contributes directly to improving diagnostic quality, accessibility and resilience
.
By enhancing coordination and resource-sharing among stakeholders, PEQAP aims to reinforce laboratory systems globally, reduce biological threats, and ensure timely, quality-assured diagnostics – critical pillars of global health security.

The Securitisation of Global Rinderpest Freedom

Date & Time

Tuesday 28 October
18:20

Authors:

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Rinderpest is the only infectious animal disease to have been globally eradicated. This milestone was achieved through concerted international efforts, which culminated in the global declaration of freedom in 2011. Since then, FAO and WOAH have worked collaboratively to reduce the security threat posed by the remaining stocks of rinderpest virus held in laboratories worldwide, and to improve preparedness for re-emergence through the implementation of a global action plan, the maintenance of diagnostic capacity and vaccine reserves, and awareness raising. This poster provides an update on the sequestration and destruction of rinderpest materials, as a follow-up to Recommendation no. 12 of the 2nd OIE Global Conference on Biological Threat Reduction, held in October 2017, in Ottawa, Canada. Since 2017, three countries have either destroyed their remaining rinderpest materials or sequestered them at an FAO-WOAH-designated Rinderpest Holding Facility (RHF): the Republic of Korea, Nigeria and Vietnam. The number of countries keeping rinderpest materials has reduced from 35 in 2013 to 17 in 2017 and 11 in 2025. In 2025, seven out of the 11 countries host FAO-WOAH designated RHFs. Further reduction of rinderpest holdings is dependent on strong political engagement with the four countries that continue storing rinderpest materials outside RHFs. FAO-WOAH-designated RHFs have committed to progressively reducing their holdings through ‘sequence & destroy’ projects, keeping only materials that are essential for diagnostics and vaccine production. The lessons from rinderpest eradication have shaped the global strategy for control and eradication of peste des petits ruminants. FAO and WOAH remain committed to securing rinderpest freedom.

Understanding the Hazard Landscape for Veterinary Services in the Context of Emergencies

Date & Time	Author
Tuesday 28 October 18:20	**Claudia Salazar** Under the supervision of Daniel Donachie and Madison Wimmers, World Organisation for Animal Health (WOAH), Paris, *France*

Veterinary Services (VS) are traditionally recognised as key actors in managing biological emergencies that affect animal health, including outbreaks of transboundary animal diseases and zoonoses. However, emergencies often arise within complex multi-hazard contexts that can trigger, amplify or cascade into biological threats, affecting outbreak dynamics and response capacity. This study examined the broader hazard landscape for VS, using the Hazard Information Profiles (HIP) developed under the Sendai Framework for Disaster Risk Reduction. A literature review was conducted in PubMed to identify peer-reviewed publications describing emergencies involving VS across various hazards (i.e. meteorological and hydrological, environmental, chemical, biological, technological, societal). Inclusion and exclusion criteria were applied to select relevant articles, resulting in 181 sources analysed. Four key analytical components were used: emergency identification, response actions, sectors involved and cascading effects. Of the 302 hazards listed in the HIP, 31.4% showed the involvement of VS in emergency contexts, of which 54.1% corresponded to biological hazards, followed by meteorological and hydrological (15.4%), multi-hazard events (13.2%), societal (4.4%), technological (3.9%), geohazards (3.3%), environmental (3.3%) and chemical hazards (2.2%). Cascading effects between hazards were reported according to the narrative information found in the literature and reinforce the need to generate multisectoral responses. VS interventions were primarily focused on ensuring animal health and welfare, protecting food security and safety, and supporting livelihood recovery. These findings highlight the necessity of adopting an all-hazards approach to emergency preparedness and integrating VS more comprehensively into national and international emergency management frameworks.

Joint Action TERROR – risks of synthetic biology and recommendations for European countries

Date & Time

Tuesday 28 October
18:20

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Introduction:
The EU project Joint Action TERROR seeks to close critical gaps in health and cross-sectoral preparedness in response to biological and chemical terror attacks. With synthetic biology advancing rapidly, misuse potential has become a growing concern. We focused on health preparedness for novel pathogenic agents and dual-use technology.

Methods:
We conducted a literature review to map and describe novel technologies (2016–2022) following a systematic approach. Secondly, a survey to evaluate existing knowledge, guidelines and regulations on dual-use aspects was distributed in the EU. Finally, a risk and recommendations report was developed.

Results:
The review identified risks associated with developments and applications in the field of synthetic biology, including examples of (re)creation of high-consequence pathogens. The survey identified a number of guiding documents on governance of dual-use research, but showed that most European countries lack a clear framework to govern these issues, except for export control regulation.

Recommendations:
With increasing sophistication and availability of synthetic biology comes a range of potential risks, accelerated by emerging technologies, such as artificial intelligence. This accelerating development raises the concern that established biosecurity measures are not sufficient to prevent malicious use of synthetic biology. To address these concerns, it is essential to adopt an interdisciplinary and intersectoral approach reaching all stakeholders.

Project 81 BIOSEC: Enhancing Biosecurity in Southeast Asia: European Union Chemical, Biological, Radiological and Nuclear Risk Mitigation Centres of Excellence (EU CBRN CoE)

Date & Time

Tuesday 28 October
18:20

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The EU CBRN CoE Initiative has been supporting CBRN risk mitigation capacities in the Southeast Asia (SEA) region through a multi-faceted approach for 16 years. The initiative is recognised for its long-term commitment, engagement with multisectoral stakeholders, strengthening ecosystems, and building both technical and adaptive capacities for real-world challenges.

Project 81 BIOSEC is one of thirty EU CBRN CoE projects in the SEA region, focused on enhancing biosecurity management across eight countries over five years, finishing in Q1 2025. It raised awareness of biological threats, including zoonotic diseases and dual-use biological materials, strengthened legislative frameworks, improved border controls for detecting biological risks, enhanced biorisk management, including effective biowaste handling in public health and animal health laboratories, and promoted collaboration among regional partners. A unique feature of Project 81 is its collaborative approach, engaging stakeholders from each partner country to assess biosecurity gaps and develop a customised training curriculum.

The poster highlights how Project 81 has strengthened partner countries' skills, knowledge and resources. It details improved compliance with the Biological Weapons Convention (BWC), International Health Regulations (IHR) and United Nations Security Council Resolution 1540 in select countries, and describes enhanced regional expertise in high-containment laboratory biorisk management. In summary, Project 81 has enhanced biorisk preparedness, improved biohazard/biothreat detection and response capabilities in partner countries and built regional expertise in biorisk management.

Laboratory Twinning: a Collaborative Approach to Sustainable Capacity Building

Date & Time	Author
Tuesday 28 October 18:20	**Dr Mariana Marrana** Preparedness and Resilience Department, World Organisation for Animal Health (WOAH), Paris, *France*

The WOAH Laboratory Twinning Programme is nearing its 20th anniversary. This flagship WOAH initiative is a widely recognised capacity building scheme that pairs WOAH Reference Centres with institutes from different Members wishing to improve their capacity in a specific domain of competence. In 2025, an internal evaluation of the Programme was concluded, shedding light on the contexts in which laboratory twinning projects have the highest likelihood of being successful and sustainable.

This poster provides an update on Programme implementation, alongside the factors identified as determinants of success in the Programme evaluation, as a follow-up to Recommendation no. 5 of the 2nd OIE Global Conference on Biological Threat Reduction, held in October 2017 in Canada. As of August 2025, 100 twinning projects have been completed, resulting in the designation of 24 new WOAH Reference Centres.

It was found that support from the national competent authority and alignment with national health priorities – along with maintaining the same team of trainees in the candidate institute – are the most important factors for twinning success and sustainability. Given the characteristics of WOAH's twinning model, it is imperative that baseline conditions related to infrastructure, workforce and sample inflow are guaranteed ahead of implementation. Other conditions, such as a prior working relationship between laboratories, geographical distance and language, were also found to be important.

These findings will inform the steering of the Programme in the coming years, aiming to optimally allocate the limited resources that allow for its implementation and continued contribution to WOAH Members' compliance with the Organisation's standards.

Data Safety, the New Frontier of Biosafety

Date & Time	Author
Tuesday 28 October 18:20	**Pascaline Bossard** Dianetis, Paris, *France*

Diseases know no borders, and their dynamics are deeply interconnected on a global scale. Similarly, the data associated with them – medical, research or biosafety information – circulate worldwide and are exposed to global threats. Today, every biological risk carries a parallel cyber risk, and ignoring this dimension is no longer an option.

Managing biological risks must now integrate cybersecurity as a central component. Physical security remains essential, but it is insufficient without robust data protection. Data safety is not merely a technical issue – it is primarily a matter of organisational governance and strategy. Embedding cybersecurity into policies, accountability mechanisms and leadership commitment ensures it shapes decisions at all levels.

Practical implementation is equally critical. Systems storing sensitive data must be secure by design, with strict access controls, encryption, and continuous monitoring. Staff training and support are essential to transform human vulnerabilities into active lines of defence, turning people from potential weak points into frontline defenders.

In cyberspace, borders do not exist, yet threats are everywhere. Reducing biological risk, therefore, requires mastering cyber risk: preventing data theft, manipulation or leaks is a fundamental part of any global biosafety strategy. Integrating data protection into organisational governance and global biosafety frameworks is no longer optional – it is now essential. Organisations that fail to act risk undermining both data integrity and overall resilience. Cybersecurity and biosafety are inseparable, and addressing them together is the new frontier of organisational safety and resilience.

WOAH Observatory's Monitoring Indicators of Implementation of International Standards Relevant to Movement Control, Zoning and Compartmentalisation

Date & Time	Authors
Tuesday 28 October 18:20	**Nahoko Ieda, Caroline Paquier** Observatory, Data Integration Department, World Organisation for Animal Health, Paris, *France*

Controlling the movement of live animals and animal products is essential for managing animal health, food safety and zoonotic risks. Effective movement control depends on robust identification and traceability systems. Zoning and compartmentalisation, as defined in the *Terrestrial* and *Aquatic Animal Health Codes* of the World Organisation for Animal Health (WOAH), may also help mitigate disease impact. WOAH Members are asked to report such control measures of animal diseases through the World Animal Health Information System (WAHIS).

The WOAH Observatory monitors the implementation of WOAH standards by indicators relevant to a wide range of topics, including movement control, zoning and compartmentalisation. According to its latest analysis, among the affected WOAH Members declaring disease limited to zones and reporting zoning as a control measure, the vast majority reported movement control as an accompanying measure, which is a prerequisite to implement zoning. In addition, reporting of zoning and compartmentalisation for disease control tended to increase between 2005 and 2023. On the other hand, the level of implementation and implementation capacity of animal health services remained unchanged in the past decades.

The analysis indicated growing understanding of zoning and compartmentalisation as disease control measures and the importance of accompanying prerequisites like movement control. To fill the remaining gaps, WOAH may consider tailored capacity-building activities, especially to enhance understanding of the interconnections between different control measures. WOAH Members could further enhance their practice by combining multiple control measures and reporting via WAHIS, in line with WOAH standards, as well as by engaging in the PVS Monitoring Cycle to leverage improvement opportunities.

Strengthening Frontline Biosafety: Piloting Standard Operating Procedures at Border Check Points for Operational Resilience and Multisectoral Collaboration

Date & Time	Authors
Tuesday 28 October 18:20	**Andriy Talama, Gunay Rzayeva, Asaf Omarov** State Service of Ukraine on Food Safety and Consumer Protection, Science and Technology Center, *Ukraine*

The increasing complexity of transboundary biological threats necessitates the establishment of standardised and operationally feasible procedures at border checkpoints (BCPs). Within the framework of Project 100: Strengthening of Front Line Biosafety and Biosecurity Measures in South East and Eastern European Region, significant progress has been achieved in developing and piloting standard operating procedures (SOPs) as part of a comprehensive biosafety and biosecurity framework. These SOPs, aligned with WOAH standards, the One Health approach, and international guidance from the WHO, CDC, EPA and UN transport regulations, address the necessity of harmonised protocols implementation for biological risk scenarios at points of entry. The SOPs cover critical areas including the use of personal protective equipment, sampling, laboratory material handling, quarantine procedures, emergency evacuation and hazardous waste management. Supplementary tools, such as risk assessment matrices, registers and implementation templates, were incorporated to ensure procedural consistency and operational resilience. The development process involved expert consultations and technical workshops, ensuring adaptation to national contexts. Practical application and inter-agency coordination were strengthened through joint field and table-top exercises, enhancing operational readiness and multisectoral collaboration among veterinary and public health authorities, customs and border security. The outcomes demonstrate improved frontline preparedness, enhanced multisectoral collaboration, and increased capacity to manage biological incidents at BCPs, marking substantial progress towards the operationalisation of harmonized biosafety and biosecurity procedures. This framework contributes significantly to national and regional biosafety and biosecurity systems, supporting global efforts to prevent and respond to cross-border biological threats in line with WOAH recommendations and international best practices.

Using Epidemic Intelligence (EI) to Monitor Animal Health Threats, including Mis/disinformation, using WOAH's Incident Management System (IMS): Case Study on Foot and Mouth Disease (FMD) in Europe

Date & Time

Tuesday 28 October
18:20

Authors

Madison Wimmers, Daniel Donachie, Paolo Tizzani, Keith Hamilton, Gerrit Beger, Camilla Caraccio, Denise Dubois, Min Kyung Park, Peter Melens, Gregorio Torres, Alexandre Fediaevsky
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In 2025, the World Organisation for Animal Health (WOAH) established an Incident Management System (IMS) to coordinate its response to animal health emergencies, with epidemic intelligence as a core pillar. This enables WOAH to combine official and unofficial information to detect, evaluate and monitor biothreats, supporting its Members and Partners and improving response.

WOAH uses the Epidemic Intelligence from Open Sources (EIOS) to scan and analyse media, reports and other informal data sources to produce timely, evidence-based situation reports. WOAH's IMS was informed through this epidemic intelligence (EI) activity.

The WOAH-IMS was activated in 2025 following the resurgence of foot and mouth disease (FMD) in some areas in Europe. WOAH staff involved in the response had previously undergone training in IMS procedures. From 3 March to 15 May 2025, news monitoring was conducted. Around 6,400 relevant news items were monitored, analysed, and summarised in weekly EI situation reports. These reports were shared internally to improve risk-based decision-making. WOAH also partnered with INTERPOL to exchange EI, including on misinformation, and coordinated efforts to engage Law Enforcement agencies to support the efforts of Veterinary Services. Based on information exchanges and analysis, the following actions were taken to support Members and Partners: coordination of actions with EU institutions and other international organisations, publication of an epidemiological report on the FMD situation, release of a Q&A to convey correct information to the public, and production of joint key messages for law enforcement in collaboration with INTERPOL. WOAH intends to continue expanding the use of EI within its alert and response mechanisms.

Taking Stock of BWC National Implementation

Date & Time	Authors
Tuesday 28 October 18:20	**James Revill, Maria Garzon Maceda** United Nations Institute for Disarmament Research (UNIDIR), Geneva, *Switzerland*

National implementation of the Biological Weapons Convention (BWC) is essential to maintaining the global prohibition on biological weapons. Over the course of the BWC's evolution, State Parties have adopted a variety of legislative, regulatory, and other measures to fulfil their obligations under the Convention.

To better understand how States are implementing the BWC worldwide, the United Nations Institute for Disarmament Research (UNIDIR) and the Verification Research, Training and Information Centre (VERTIC) have developed the BWC National Implementation Measures Database. This publicly accessible, searchable resource contains detailed information on the national implementation measures undertaken by all 189 States Parties to the BWC.

The database is designed to strengthen the Convention's implementation by enabling States and other stakeholders to explore diverse national approaches, identify gaps, and uncover opportunities to reinforce domestic frameworks. It also serves as a confidence-building tool, promoting trust, transparency and international cooperation in support of the BWC.

Drawing on the database, this poster will present an analysis of global and regional measures across the following seven key categories relevant to the BWC in particular, as well as to biological threat reduction in general:

- Prohibitions
- Export, Import and Transfer Controls
- Biosafety and Biosecurity
- Oversight of life sciences dual-use research
- Governmental organisation for the BWC
- BWC Confidence Building Measures
- BWC Assistance and Cooperation offers.

The analysis will identify where progress was made, and which areas may require further attention. By providing an evidence-based overview, the poster will offer a concrete resource for advancing collective resilience against biological threats through informing policy and guiding assistance.

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Sustainability and Resilience in Global Biosecurity: Rethinking Implementation for Lasting Impact

Date & Time	Author
Tuesday 28 October 18:20	**Dr Susanne M. Köhler** Robert Koch Institut, Berlin, Germany; working within the German Biosecurity Programme

The evolving landscape of biological threats demands innovative and sustainable biosecurity approaches. Drawing on years of international cooperation, this poster emphasizes the need to rethink not only *what* we do in biosecurity but *how* we implement it to achieve truly sustainable and resilient impact worldwide.

In a complex and uncertain world, where future threats remain unknown, it is essential for countries to cultivate self-awareness and self-reliance by developing and utilising their own diverse capacities to manage biological crises. A monoculture of biosecurity strategies risks systemic vulnerability; diversity in methods, strategies, preparedness, and even skills, enhances resilience and adaptability.

Furthermore, established principles must be deeply anchored within local structures – embedded in ways that require minimal ongoing effort and serve purposes beyond potential crises. Without practical, everyday relevance, biosecurity frameworks risk becoming dormant or obsolete.

The poster also highlights critical but often overlooked factors indirectly related to biosecurity, such as equipment maintenance, communication, planning and organisational skills. These foundational elements can determine success or failure, yet they are frequently underestimated in biosecurity efforts.

Ultimately, this work advocates for a diversification of solutions that integrate biosecurity practices within local frameworks to ensure continuity, ownership, and a broader perspective on resilience – addressing both direct and indirect challenges to biosecurity sustainability.

Blurred Stories on Bird Flu: Discourse Analysis of 15 years of YouTube Content

Date & Time

Tuesday 28 October
18:20

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Digital platforms have become central spaces for health-related information seeking. Information dynamics – particularly intensified during periods of uncertainty – blur the boundaries between scientific evidence, opinion and rumour, thereby shaping public perceptions of health risks. This study aims to explore the dynamics of avian influenza–related content on YouTube, adopting an interdisciplinary methodology. Using topic modelling, sentiment analysis and social network analysis, we identify prevailing narratives, detect potentially harmful or misleading content, and evaluate its impact on public risk perception and individual behaviour.

From 2010 to 2025, 22,025 videos and 230,445 comments regarding avian flu were included. Dominant themes include human cases, outbreaks in poultry farms, economic impact on food supply, pets' infections, pandemics and vaccination, virus detection in raw milk, and public concerns over food safety in the dairy industry. Predominance of neutral comments (58.5%), followed by negative comments, is observed.

The thematic analysis reveals a clear diversity in the discourses present in video transcripts and user comments. While the videos primarily address informative, scientific or institutional themes, comments more frequently reflect personal viewpoints, emotional responses or alternative narratives. This divergence underscores an asymmetry between the production and reception logics of information on YouTube.

Social network analysis suggests a compartmentalised flow of information: users tend to engage around specific videos without crossing into discussions occurring in other clusters. This fosters filter bubble dynamics, where opinions, emotions or narratives rarely encounter counter-discourses.

These findings suggest that information flows around avian influenza on YouTube involve complex processes of appropriation, reinterpretation and polarisation, influencing public understanding of health issues.

United Kingdom Microbial Forensics Consortium (UKMFC)

Date & Time	Authors
Tuesday 28 October 18:20	**Rhiann Coffey, Sarah Lumley, Daniel Dorey-Robinson, Fiona Poulter, Jennifer Harris, Simon Weller, Graeme Clark** Defence Science and Technology Laboratory, *United Kingdom*

The UKMFC forms part of the 2023 UK Biological Security Strategy, taking a One Health approach comprising frontline biosurveillance laboratories from the clinical, veterinary, plant, food and aquaculture sectors across all four nations of the UK. The project aims to strengthen microbial forensics as a national capability with a central theme of determining (as far as possible) whether a given organism has arisen naturally or is a consequence of a nefarious release. This poster outlines how we have established the UK microbial forensics consortium by working cooperatively across sectors.

We undertook a stocktake of UK frontline biosurveillance laboratories – including WOAH reference laboratories involved in animal and aquaculture health in the UK – and identified genomics and bioinformatics as an area of strength, which provided the initial focus for improving the microbial forensic capability. To harness this strength, the UKMFC Bioinformatics Working Group was established to develop a suite of tools that will support front-line surveillance laboratories.

Common microbial forensic and attribution working practices and procedures are also in development, led by our Forensic Working Group. A core role of this group is to build engagement and consensus within the Microbial Forensics community on best practice and generate awareness of forensic processes for attribution of a biological incident.

The UKMFC laboratory network has now been established as a step towards an ‘interim operating capability’, a new alert system for the UK to detect and attribute the misuse of biological materials.

Challenge of Clinical Waste Disposal in BSL-2 and Diagnostic Laboratories in Indonesia

Date & Time	Authors
Tuesday 28 October 18:20	**Indrawati Sendow, Susan M. Noor** Research Centre for Veterinary Science, National Research and Innovation Agency, *Indonesia*

The disposal of clinical waste from Biosafety Level 2 (BSL-2) and diagnostic laboratories in Indonesia presents significant challenges that threaten public health and environmental safety. These facilities, including university laboratories, generate hazardous biological materials that require specialised management protocols to prevent cross-contamination, disease transmission and ecological damage. Current obstacles to effective clinical waste management include limited access to appropriate treatment technologies, inadequate awareness of biosafety fundamentals, insufficient staff training, inadequate funding, lack of standardised waste treatment protocols, and inconsistent regulatory enforcement. Indonesia's geographic diversity and varying resource availability across regions further compound these disposal challenges. This poster examines the critical obstacles in managing clinical waste, explores the key obstacles in managing clinical waste within Indonesian BSL-2 diagnostic and university laboratories, evaluates current disposal practices, and proposes comprehensive improvement strategies. Recommendations include implementing stricter policy frameworks, investing in advanced waste treatment technologies, and developing capacity-building programmes for laboratory personnel to ensure sustainable waste management practices.

BRITE6: Enhancing National Multisectoral Coordination in Response to Biological Threats through Joint Investigation Simulation in Malaysia

Date & Time

Tuesday 28 October
18:20

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The Bio-Response Joint Investigation Training and Evaluation (BRITE) programme supports Malaysia's obligations under the Biological and Toxin Weapons Convention (BTWC) by enhancing national capacity in biological threat response. BRITE6, organised by the Department of Veterinary Services (DVS), is a five-day programme involving 70 participants and 20 trainers from multiple agencies including the Department of Veterinary Services (DVS), Ministry of Health (MOH), Royal Malaysia Police (PDRM), Fire and Rescue Department (JBPM), Malaysian Armed Forces (ATM), Defense Science & Technology Research Institute (STRIDE), Malaysian Quarantine and Inspection Services (MAQIS), and the National Security Council (MKN).

Centred around a full-scale anthrax outbreak scenario at an international checkpoint, the exercise simulates deliberate biological release, zoonotic transmission and public exposure. Participants are trained in crime scene management, hazardous sample collection, responder decontamination, legal protocols, and cross-agency communication.

The programme features interactive lectures, tabletop discussions, and a full joint investigation and sampling exercise at a mock crime scene. This immersive experience allows participants to apply practical skills in evidence handling, detection and multisectoral coordination in a high-threat setting.

BRITE6 is expected to demonstrate improved operational readiness, clearer role understanding, and strengthened collaboration across sectors. Originally adapted from FBI/CDC models, the programme is now fully localised and serves as a potential reference for other countries implementing BTWC Article IV through national capacity-building efforts.

Mobile Laboratories and Point-of-Care Diagnostics for Joint One Health Outbreak Response

Date & Time

Tuesday 28 October
18:20

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During outbreaks, the rapidity of response and identification of the threats are key in the management and containment of the epidemics. Emerging diseases often appear in countries with limited resources within isolated locations, distant from laboratories capable of identifying the pathogens or diagnosing the patients. For teams dedicated to surveying and responding to outbreaks, it is essential to develop an efficient and amenable capacity to be deployed directly in the field with adapted diagnostic capabilities.

MediLabSecure is an international One Health project, sponsored by the European Commission, and working on preparedness and prevention of zoonotic viruses in 22 Mediterranean and Sahel countries.

During the MediLabSecure project, three onsite workshops were organised to sensitise and train scientists from human and animal virology and medical entomology on the usefulness and techniques of these field tools. We trained scientists in sampling techniques for mosquitoes or ticks and animals, and identification and sequencing of arboviruses using point-of-care molecular biology tools. Different types of Mobile Laboratories were presented and used by the participants: Suitcases (Type I) and trucks (Types II and III) from the Institut Pasteur de Dakar (Senegal) and Institut Pasteur de Tunisie (Tunisia), and a suitcase-based mobile laboratory (Type II) from Institut Pasteur in Paris (France). These trans-sectoral trainings benefited 42 scientists from three sectors (18 men and 24 women), coming from 21 countries of the region.

A Practical Approach to Strengthening Biosafety and Biosecurity Capabilities at Border Crossing Points: the BIOCAP-ECA Regional Workshop Experience

Date & Time

Tuesday 28 October
18:20

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Project 99 (BIOCAP-ECA), under the EU CBRN Risk Mitigation Centres of Excellence Initiative, has 11 East and Central African Partner Countries working to strengthen their biosafety and biosecurity capabilities. Our poster will focus on a Regional Workshop and Practical Drill, conducted in Mombasa, Kenya (26–30 May 2025), which addressed critical gaps in biological threat response at border crossing points identified during field visits to Kenya, Uganda and Tanzania. Strong borders are essential to control the introduction of diseases and the smuggling of high-threat biological agents.

Twenty-two participants received comprehensive training combining theoretical presentations with extensive hands-on exercises. The workshop focused on strengthening interagency communication and response mechanisms for biological threats, building technical skills in detection, sampling, packaging, and managing biological materials, and enhancing regional collaboration to address biological agent smuggling.

Key activities encompassed international regulatory frameworks for biological material transport, profiling methods to identify suspicious activities at borders, personal protective equipment (PPE) donning and doffing procedures, decontamination protocols, biological agent detection using rapid tests and specialised equipment, crime scene investigation and sampling techniques. The training culminated in a scenario-based practical drill simulating a response to a detected biological threat at a border crossing point.

Evaluation results demonstrated exceptional participant satisfaction and highlighted the use of locally purchased PPE for all exercises. Participants particularly valued the methodology combining short theoretical sessions with extensive practical demonstrations and hands-on training. The workshop successfully enhanced regional capacity for biological threat detection and response while fostering cross-border cooperation among border security professionals in East and Central Africa.

Analysing Emergency Preparedness and Response: an Evaluation of Animal Disease Contingency Plans in Five African countries

Date & Time

Tuesday 28 October
18:20

Authors

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Africa's livestock sector is projected to grow two- to eightfold between 2030 and 2050. However, this growth is threatened by climate change, armed conflicts, and the persistent risk of animal disease outbreaks. Rapid and effective responses to such outbreaks are critical to limiting their economic, public and animal health consequences. This response is detailed in contingency plans, which outline how governments should act during animal health emergencies. Despite their importance, African countries often face challenges in implementing these plans, particularly due to limited financial resources. To better understand other barriers to implementation, this case study reviewed contingency plans from five African countries: Algeria, Republic of the Congo, Kenya, Morocco, and Tanzania. Semi-structured interviews with 16 international subject-matter experts and government officials representing the Veterinary Services of case study countries were also conducted. These interviews identified best practices, country-specific challenges, and recommendations for strengthening emergency preparedness. Findings reveal that while contingency plans are comprehensive, they lack national ownership, having been developed under international pressure or with limited stakeholder consultation. In several cases, plans remain internal to Veterinary Services and lack the political endorsement to secure timely emergency funding.

A weak public–private interface also hinders implementation, as farmers and breeders are not sufficiently consulted. As one of the first studies to analyse the implementation of animal disease contingency plans, this research can assist case study countries to identify low-hanging fruit and improve their emergency preparedness and response capacities. Findings also support targeted technical assistance from international partners.

Keywords:
Africa, Animal health emergencies, Contingency plans, Disease control, Disease outbreak, Emergency preparedness and response.

Collaborative Approach to Strengthen the UNSGM

Date & Time	Authors
Tuesday 28 October 18:20	**Ines Mergler, Anja Blasse, Stefan Kloth** Robert Koch Institute, *Germany*

The current landscape in health security is characterised by increased threats and limited resources. However, crucial institutions in this context, such as the United Nations Secretary-General's Mechanism for the Investigation of Alleged Use of Chemical and Biological Weapons (UNSGM), need the readiness and capacity to respond. While the Organisation for the Prohibition of Chemical Weapons (OPCW) has a permanent capacity to investigate the use of chemical weapons, this is lacking for the UNSGM, which is the only mechanism to investigate an alleged use of biological weapons. As a Member States mechanism, the UNSGM relies on the financial support and active commitment of UN Member States to build the necessary capacity. Germany has been a strong supporter of the UNSGM since 2013. In addition to strengthening the analytical capabilities of rostered laboratories, the Robert Koch Institute supports the operational readiness of rostered experts for their possible deployment. Against the backdrop of initiatives to coordinate action such as the Group of Friends of the UNSGM, the project presented in this poster has put a collaborative approach at the forefront, partnering in the development of workshops, training courses and simulation exercises. Increased focus has been on strengthening ties with states that are underrepresented on the roster, most importantly in Africa and Latin America. Through the involvement of a more diverse set of stakeholders from all world regions, the project aims to support recent outreach efforts by UNODA to ensure that the UNSGM can achieve its objective: independent international investigation of alleged biological weapons use.

The Re-emergence of Anthrax in Nigeria, a Biothreat within the Lens of One Health: Associated Drivers and Intervention

Date & Time

Tuesday 28 October
18:20

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Anthrax is a neglected zoonosis, mediated by exotoxins, and caused by spore-forming *Bacillus anthracis*. It's a bioterrorism agent, and among zoonoses causing millions of global illnesses and deaths, posing significant biothreats to global health, livelihoods and economies. Anthrax re-emerged in Nigeria on 27 June 2023. This study assessed stakeholders' knowledge/perception towards anthrax occurrence and spread at the human-animal-environment interface. We hypothesised that climate change and anthropogenic activities cannot drive its emergence.

A questionnaire-based cross-sectional study was conducted in Nigeria. Descriptive and analytical statistical analyses were performed. All 384 recruited stakeholders participated. A conceptual One Health framework was designed for surveillance/intervention.

The majority (96.2%) of animal health practitioners (AHPs) and pastoralists (56.7%) knew about recent anthrax emergence in Nigeria ($p < 0.001$). Notably, 88.5% of AHPs and 32.2% of pastoralists mentioned the environment to be an anthrax source. From the environmental perspective, 87.7% of AHPs and 24.0% of pastoralists significantly perceived soil and aerosol contaminated with anthrax spores as highly plausible routes for its re-emergence. Extreme weather events (high rainfall, flooding, and winds) ($p = 0.001$); livestock grazing on pastures grown on contaminated soil ($p < 0.001$), transboundary animals' movement and trade ($p = 0.001$); new animals introduce into herds without quarantine ($p = 0.001$); and bioterrorism ($p < 0.001$) were deemed to be more likely to influence anthrax re-emergence and spread according to respondents.

To tackle anthrax knowledge/perception gap and address its drivers, a One Health approach is needed. This will promote surveillance towards its detection, tracking, control, and prevent prospective global biothreats.

Rabies Control in Madagascar: Reactive Measures and Strategic Vision

Date & Time

Tuesday 28 October
18:20

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Rabies, a viral zoonosis with nearly 100% fatality, remains a major public health concern and biological threat, causing an estimated 59,000 human deaths annually. Madagascar is severely affected, with 300–800 estimated deaths per year. Despite the presence of a national surveillance network (MADSUR) and a reference laboratory, rabies persists.

This study presents the epidemiological situation of rabies in Madagascar from April 2023 to April 2025 and outlines key control measures. A retrospective descriptive analysis was conducted using MADSUR data. All susceptible animal species were included, with non-probabilistic sampling based on reported cases. Data were analysed for temporal, spatial and species distribution.

During the study period, 525 suspected animal cases were reported. Of 71 samples tested, 64 were laboratory-confirmed. Dogs accounted for the majority (425 suspected cases), followed by cattle (92). Cases were geographically widespread across multiple regions.

Control efforts included:

- Mass vaccination of 20,769 animals across three campaigns;
- Ring vaccination of 62,860 animals in 34 districts;
- Training of 172 animal health professionals;
- Public awareness initiatives via audio, video and community outreach.

Findings confirm rabies endemicity and the central role of dogs in transmission. However, underreporting and lack of reliable dog population data likely obscure the true burden. Most interventions were reactive rather than preventive.

A proactive national strategy and One Health approach are urgently needed. Future priorities include validating a strategic plan, deploying oral vaccines for stray dogs, and enhancing field diagnostic capacity to advance rabies control and elimination.

Keywords:
Action implemented, Epidemiology, Madagascar, One Health, Rabies.

Strengthening Biosafety and Biosecurity in Animal Health Laboratories in Morocco through FIRABioT Capacity-Building Training

Date & Time	Authors
Tuesday 28 October 18:20	**Nabil Abouchoaib, Mina Ettair, Mohammed Ait Lachgar, Abderrahman El Abrak** National Office for Food Safety (ONSSA), *Morocco*

The increasing global risk of biological threats, including emerging pathogens, zoonoses and potential acts of bioterrorism, highlights the urgent need for enhanced biosafety and biosecurity capacities. As a beneficiary of the Fortifying institutional resilience against biological threats (FIRABioT) Project, launched by the World Organisation for Animal Health (WOAH) to improve its Members' abilities to respond to emergencies (including agro-crime and agro-terrorism events), Morocco received support to implement a number of selected activities aimed at building its capacity in the following areas: emergency management, disease intelligence, sustainable laboratories and veterinary legislation.

Within the framework of the FIRABioT project, Morocco benefited from a tailored training activity on biosafety and biosecurity in animal health laboratories, jointly organised by WOAH and ONSSA.

The training aimed to equip laboratory personnel with the knowledge and skills necessary to manage biological risks effectively, thereby protecting laboratory staff, animal and human health, and the environment. Participants, representing all ONSSA laboratories, were introduced to international and national policies on biosafety and biosecurity, risk assessment methodologies, safe handling of biological materials, personal protective equipment (PPE) practices, waste management, decontamination and mitigation strategies.

Key learning outcomes included the ability to conduct risk assessments, implement risk mitigation measures, establish standard operating procedures, and link laboratory practices to relevant regulatory frameworks. The training also fostered a culture of biosafety and biosecurity, contributing to sustainable laboratory systems in Morocco.

This initiative demonstrates Morocco's commitment to strengthening institutional resilience against biological threats. It also reflects the importance of capacity-building programmes in advancing global health security, aligning with FIRABioT's broader objectives of reducing biological threats in Africa through preparedness, sustainable laboratories, and intersectoral collaboration.

A Systems Framework for Assessing AI-Enhanced Biological Warfare Capability

Date & Time

Tuesday 28 October
18:20

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Advances in artificial intelligence (AI) and synthetic biology have significantly altered the strategic calculus for state-level bioweapon development, yet existing assessments fail to account for how AI acceleration of synthetic biology fundamentally alters bioweapon utility calculations. This research develops the first integrated analytical model to assess how AI capabilities affect bioweapon utility in international competition.

We constructed a tripartite strategic framework categorising bioweapon applications as warfare, coercion and subversion. For each category, we systematically mapped tactical, biotechnological, and political requirements using an adapted pathogen assessment framework and novel political constraint matrices. We use causal loop diagrams to model dynamic interactions between enabling factors (e.g. AI dataset availability, synthetic biology capabilities, security dilemma dynamics) and constraining factors (e.g. international law compliance, attribution requirements, technological complexity). This approach identifies specific leverage points where AI capabilities most significantly alter traditional bioweapon limitations.

Key findings include that AI acceleration particularly enhances bioweapon viability in subversion scenarios by improving pathogen design precision while maintaining plausible deniability. The analysis reveals that dataset availability and flexible biological manufacturing capacity are critical variables affecting bioweapon utility. Our framework identifies deterrence by denial and multilateral oversight strengthening as the most important intervention points for reducing AI-enhanced biorisk.

This work provides the first systematic integration of strategic theory, biotechnology assessment, and AI impact analysis for state-level bioweapon evaluation. The framework enables effective policy development and targeted mitigation strategies to reduce the convergent risks presented by AI and biotechnology in international competition.

Building Strong Laboratory Systems and National Reference Laboratories to Face Biological Threats for Epidemic Preparedness and Response – Experience from Uganda

Date & Time

Tuesday 28 October
18:20

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Between 2000 and 2020, Uganda experienced over 49 viral haemorrhagic fever (VHF) outbreaks. The National Health Laboratory and Diagnostic Services (NHLDS) has been at the centre of the response to these outbreaks, providing leadership and coordination to the laboratory pillar. Uganda's leadership extends regionally, supporting laboratory capacity in 23 African countries while maintaining international accreditation for 82 national laboratories.

In April 2025, the NHLDS was assessed on both core and operational capacities for five pathogens during the Sudan Virus Disease (SVD) outbreak, showcasing its commitment to biological threat reduction and international cooperation. This constituted a pilot of the World Health Organization's (WHO) laboratory recognition programme, set to launch in late 2025.

Findings indicated that Uganda has made significant strides in strengthening its national laboratory systems to enhance outbreak preparedness and response, particularly for zoonotic diseases such as VHF. The assessed laboratories demonstrated robust testing capacities for the selected pathogens, achieving scores between 85% and 100% across core technical and operational standards.

This performance reflects strong governance, advanced diagnostic, genomic and wastewater surveillance, and resilient systems. Also, through the NHLDS, the country has institutionalised multisectoral collaborations, integrated public health laboratory networks, and implemented laboratory-based surveillance strategies. These efforts have enabled decentralised testing capabilities, crucial during health emergencies.

Uganda's experience exemplifies how national, regional and international entities can align to reduce biological threats through shared standards, capacity building, and mutual accountability. These achievements underscore the importance of sustained investment in national laboratory systems as a cornerstone of global health security and epidemic resilience.

WOAH European Region National Veterinary Services Preparedness for Biothreats

Date & Time	Author
Tuesday 28 October 18:20	**Gary Vroegindewey** Lincoln Memorial University College of Veterinary Medicine, *USA*

A 2014 survey of WOAH European Region Veterinary Services on 'Animal health in the light of natural disasters and bioterrorism' demonstrated a wide range of capabilities within the region. In that survey, nearly 80% of respondents indicated the legal responsibility to investigate animal-directed or bioterror events. A smaller number, 73%, indicated they possessed the necessary capabilities for response. Seven countries indicated they had the authority and/or responsibility to investigate animal-related bioterrorism events, but lacked the capacity. Three countries identified the capacity to investigate animal-related bioterrorism events, but lacked the authority. The WOAH European region, in conjunction with Lincoln Memorial University College of Veterinary Medicine (USA), has conducted a 2025 survey specifically on National Veterinary Services preparedness for biothreats. Ninety-five percent of respondents indicated the legal responsibility for managing biothreat events, 84% reported animal issues were incorporated into their national response frameworks, 74% reported having specific contingency plans, 89% reported training for biothreat events, and 74% indicated they would benefit from WOAH European region assistance. Significantly, when compared to 2014, the following was reported as preparedness for biothreats: Much better (12%), Somewhat better (72%), No change (12%) and Somewhat worse (6%). There has been a general trend towards improvement, with several WOAH activities cited as contributing to the change.

Reference:

[1] Vroegindewey G. Animal health in the light of natural disasters and bioterrorism. Paris (France): World Organisation for Animal Health; 2014. 11 p. Available at: https://www.woah.org/fileadmin/Home/eng/Publications_%26_Documentation/docs/pdf/TT/2014_EUR1_Vroegindewey_A.pdf (accessed on 21 October 2025).

Mitigating the Health Consequences of Deliberate Events using Foresight Methodology – Application of Machine Learning for Optimising Future Scenarios

Date & Time	Authors
Tuesday 28 October 18:20	**Harris Héritier, Margaux Mathis Manoua, Nahoko Shindo** World Health Organization, Geneva, *Switzerland*

Strategic planning approaches such as foresight can significantly lower the impact of public health events by anticipating them and enabling proactive, swift and effective interventions, preventing potential threats from occurring or mitigating their impact. Here, we explore the application of machine learning to enhance foresight methodology, specifically in the context of mitigating health consequences from deliberate events like Chemical, Biological, Radiological, or Nuclear (CBRN) incidents. Indicators relevant to those incident types were selected through expert consultations and collected from the most credible, highly reputed sources in the form of time series. They were selected and aggregated into key factors using Principal Component Analysis. Key factors for future projections were generated using the Prophet algorithm, and the uncertainty and magnitude of change for these factors were analysed. The results highlight the relationship between uncertainty and the magnitude of change across different World Health Organization (WHO) regions and globally, revealing key regional and global concerns. Across all WHO regions, we identified that cybersecurity and access to communication were the most relevant key factors in terms of magnitude of change, therefore requiring immediate interventions. The magnitude of uncertainty of the key factors varies by region, hence region-specific scenarios should be developed for foresight work on deliberate event prevention and impact mitigation actions. The study demonstrates the potential for automating parts of the foresight methodology via machine learning and provides a trend analysis to identify key factors. The framework proves useful for the identification of leverage points to alleviate health impacts of deliberate events.

Engineered Pandemics: Rethinking Coordination Between the BWC and WHO in a New Era of Biological Risk

Date & Time	Author
Tuesday 28 October 18:20	**Anthony Torres-Ruesta, Siphiwe Khumalo, Bokai Chen, Abhaya Shekhar Adhikari**

Engineered pandemics are large-scale outbreaks caused by the intentional release of genetically modified pathogens. Our poster presents a fictional scenario to explore how the Biological Weapons Convention (BWC) and the World Health Organization (WHO) would respond to such a threat. The poster identifies key gaps and missed connections between global health and biosecurity frameworks, and proposes opportunities to strengthen interoperability, early warning and joint response to prevent future intentional or accidental biological threats.

From Policy to Practice – Alignment of OHTAPZ Methodology with One Health Reporting Requirements

Date & Time

Tuesday 28 October
18:20

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The One Health Transboundary Assessment for Priority Zoonoses (OHTAPZ) tool addresses the need for a multisectoral approach in assessing transboundary zoonotic disease threats within and across shared land borders. OHTAPZ builds on the One Health Systems Assessment for Priority Zoonoses (OHSAPZ) [1] expanding stakeholder identification and disease prioritisation processes in Phase 1, replacing case studies in Phase 2 with an interactive tabletop exercise, incorporating a partner-led strengths, weaknesses, opportunities and threats analysis in Phase 3, and introducing two new phases: Phase 4 on preparedness and operational readiness at Points of Entry (POEs) [2], and Phase 5, a Simulation Exercise and After-Action Review.

To explore how OHTAPZ can serve as a foundation for countries to assess and develop multisectoral approaches to strengthen One Health capacities, we mapped outputs from our OHTAPZ phases against capacities/indicators in the International Health Regulations' States Parties Self-Assessment Annual Report, Joint External Evaluation and the Performance of Veterinary Services, and against the Quadripartite One Health Joint Plan of Action (2022–2026) five steps. We found that OHTAPZ could assess and address a variety of capacities under the IHR, PVS, and OH JPA, thereby consolidating initial processes required by each framework. The data collected using OHTAPZ, through the One Health lens, can be fed into more traditional public or animal-health led frameworks such as SPAR, JEE and PVS, as well as inform national One Health action plans. Our methodology can support activities outlined by the WHO, WOAH and the Quadripartite to advance and sustainably scale up One Health systems strengthening.

References:

[1] Fogarty AS, Miller LN, Standley CJ, Sorrell EM. One Health systems assessment for priority zoonoses. A tool for cross-sectoral prioritization of zoonotic diseases, and mapping of systems for One Health coordination. 3rd Ed. Washington, DC (United States of America): Center for Global Health Science and Security; 2023. https://doi.org/10.57928/4755-9823

[2] Linder AG, Hogan KM, Sorrell EM. One Health POE checklist for transboundary zoonotic disease preparedness. Baltimore (United States of America): Johns Hopkins Research Data Repository; 2025. https://doi.org/10.7281/T1N1YCKS

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