Working Group on the Strengthening of the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction

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Identifying, examining and developing specific and effective measures, including possible legally-binding measures, and making recommendations to strengthen and institutionalize the Convention in all its aspects within the mandate of the Working Group

UK Capabilities Relevant to Implementation and Operationalisation of Article VII of the Biological and Toxin Weapons Convention*

Submitted by the United Kingdom of Great Britain and Northern Ireland

I. Introduction

1. Operationalising assistance and response under the Biological and Toxin Weapons Convention (BTWC) and improving preparedness such that detection and response to any biological event is efficient and coordinated is of vital importance to global health and agricultural security. As such, the UK has identified this as a key priority in strengthening domestic and international biosecurity. Following several years of constructive engagement on this topic, the Working Group has an opportunity to deliver clear, practical recommendations. This working paper summarises UK capabilities that support the implementation and operationalisation of Article VII, and which could be included in the proposed database of available assistance. All capabilities presented are detailed in the UK's 2023 Biological Security Strategy (BSS)[1].

II. UK Public Health Rapid Support Team (UK-PHRST)

2. The UK Public Health Rapid Support Team (UK-PHRST), introduced in a previous UK working paper[2], works to address the emergencies that may happen today and understand how to make our future responses more effective. The team is on standby to tackle outbreaks of infectious disease anywhere in the world within 48 hours. Objectives include:

- Saving lives and outbreak response;
- Innovative research to generate evidence on best practices for outbreak control;

* The present document is being issued without formal editing.

[1] **UK 2023 Biological Security Strategy:** https://www.gov.uk/government/publications/uk-biological-security-strategy/uk-biological-security-strategy-html

[2] **BWC/MSP/2018/MX.4/WP.2** - The United Kingdom public health rapid support team concept – Submitted by the United Kingdom of Great Britain and Northern Ireland

- Capacity building for outbreak response in low and middle-income countries eligible for UK Government Support.

3. The team has a One Health focus and consists of a multidisciplinary team including expert epidemiologists, microbiologists, infection prevention and control personnel, clinical researchers and social scientists. Experts are drawn from government, industry and academia.

4. The UK-PHRST can receive requests for deployment through the World Health Organisation's Global Outbreak Alert and Response Network (GOARN), directly from the government of the state affected by the epidemic, or through the UK's Emergency Medical Team (EMT) and Foreign Commonwealth and Development Office (FCDO).

5. Between April 2017 and April 2022, the UK-PHRST has supported 26 outbreak responses, deploying 80 staff with 522 weeks in the field. Deployment locations have included Bangladesh, Cambodia, Czech Republic, Democratic Republic of Congo, Nigeria, Philippines, Slovakia and South Sudan, in response to various suspected and confirmed disease outbreaks including Lassa fever, Ebola, COVID-19, Yellow fever, Viral Haemorrhagic Fever (VHF), and Cholera.

6. Since May 2022, the UK-PHRST have continued deploying internationally to strengthen capacity and response to infectious diseases. Locations have included Burkina Faso, Egypt, Haiti, Kenya, Malawi, Papa New Guinea, Somalia, South Sudan, the Solomon Islands, Uganda and Zimbabwe.

7. Further information regarding UK-PHRST deployment and capacity strengthening locations and research partners is available online, with quarterly updates.[3]

8. When not responding to a disease outbreak, the team studies how best to deal with different types of outbreaks, working in partnership with host countries and other international responders. Since its establishment, UK-PHRST has undertaken 42 research projects supporting outbreak prevention and response across a range of geographies and disciplines.

9. Recent projects include:

- In October 2023, the UK-PHRST and the NCDC launched the co-created project "Epidemiological and clinical investigation of monkey pox in Nigeria: A multi-disciplinary research project to inform case management and outbreak prevention and control". This project is taking a One Health approach, incorporating clinical studies to understand the clinical characteristics, patterns and routes of infection and associated risk factors, and behavioural studies to identify the experiences of people with confirmed mpox and those close to them.
- In the same month, UK-PHRST and the EMRI-Wellcome Trust Research Programme, Kilifi, Kenya, launched the project "Rapid virus genomics for outbreak investigation (RAViG) – Assessing the feasibility and added value in coastal Kenya". The central aim of the project is to assess the implementation of real-time field genomics ("portable sequencing") to support investigation and management of suspected viral outbreaks in coastal Kenya. The project team will also work with the Kenyan Ministry of Health, Africa CDC, and the Regional WHO in delivering this research.

10. Infectious disease outbreaks can also have a substantial impact on people's psychosocial well-being. In recognition of this, UK-PHRST have dedicated a Mental Health and Psychosocial Support (MPHSS) team that works across the African and the Eastern Mediterranean regions, on projects ranging from research and capacity strengthening activities to deployments. The team works to integrate mental health into outbreak response plans and procedures, to improve the mental health and psycho-social wellbeing of people affected, including staff from organisations assisting on the ground.

[3] **UK-PHRST updates:** https://www.lshtm.ac.uk/research/centres-projects-groups/uk-phrst#updates

III. UK Microbial Forensics Consortium (UKMFC)

11. Microbial Forensics provides information to aid both the immediate response and subsequent remediation phases of a biological incident. Such information can include, but is not limited to, evidence of deliberate biological engineering, presence of anti-microbial resistance, source attribution, and evidence of prior laboratory growth, pathogenicity determinants, and signatures for the subsequent development of diagnostic assays. As such, Microbial Forensics aims to determine whether a biological agent or incident is natural, accidental or deliberate in origin.

12. Strengthening the UK's Microbial Forensics capability is a key outcome of the UK's Biological Security Strategy. This capability seeks to characterise and report biological risks when they emerge as early and reliably as possible. A core element of strengthening the UK's microbial forensics capability is the development of the UK Microbial Forensics Consortium (UKMFC), established in July 2023.

13. The UKMFC incorporates a One Health approach and seeks to improve the preparedness of the UK from a potential harmful release of biological agents. It is also envisaged to act as a deterrent against the deliberate misuse or misapplication of biological materials.

14. Currently, the UKMFC is led by the UK's Ministry of Defence (MOD). When fully operational, this capability will comprise a network of biosurveillance laboratories from all four nations of the UK with support from other institutes, academia, and industry.

15. To provide governance across all UKMFC activities and to ensure that appropriate standards of work can be met in the event of an investigation of a biological attack, a UKMFC advisory board has been established. The advisory board is comprised of strategic leaders from UK aquaculture, clinical, food, plant, veterinary, public health, defence & security, and policing sectors.

16. The UKMFC has also established the following Working Groups (WG) to harness appropriate expertise:

- **Bioinformatics WG**: The aim of this group is to develop bioinformatics tools that can augment existing sector specific bioinformatics capability to answer questions such as whether an identified pathogen has been deliberately engineered. This WG comprises bioinformatic and biosurveillance experts from across government and academia.
- **Forensics and Sampling WG**: This group will consider questions such as how alerts are generated within individual sectors, how sampling as close to the index case of an incident can be achieved, and how chain-of-custody of samples within the different laboratories of the UKMFC will be maintained.
- **Quality WG**: This will ensure that analytical methods developed by the UKMFC meet the highest possible accreditation and validation standards and comply with relevant domestic and international legislation.[4]

IV. PATH-SAFE Programme

17. Foodborne diseases are a major public health risk for both humans and animals. The majority of human infectious disease is caused by a handful of pathogens, often entering the food chain from livestock or the environment. The agricultural food supply chain also presents the potential for transmission of Antimicrobial Resistance (AMR) via food, animals, humans or water. Therefore, the threat of foodborne and AMR pathogens are connected and need to be addressed concurrently.

[4] Forensic Science Regulator Act 2021: https://www.legislation.gov.uk/ukpga/2021/14/contents

18. The Pathogen Surveillance in Agriculture, Food and Environment (PATH-SAFE) programme[5], is a UK wide and cross-government programme that is piloting the development of a national surveillance network to improve the detection and tracking of foodborne human pathogens and associated AMR through the whole agricultural and food system. This project is specifically incorporating a One Health approach.

19. Led by the Food Standards Agency (FSA), the latest-DNA sequencing technology and environmental sampling is being used to establish a new data platform that will allow for the analysis, storage and sharing of pathogen sequence and source data across the UK. This single system will enable rapid identification and tracking of food borne diseases and AMR, ultimately improving public health and minimising the environmental and economic impact of infectious disease outbreaks.

20. In February 2024, PATH-SAFE secured an additional £4.7m of funding for an extra year of work (April 2024 to March 2025). As such, the programme will continue to develop its four work streams, which include:

- National Foodborne Diseases genomic data platform;
- New surveillance approaches in FBD and AMR;
- Rapid, in-field diagnostic technologies;
- Environmental AMR Surveillance.

21. As part of strengthening the PATH-SAFE programme, a two-day PATH-SAFE Biosurveillance Conference was held in London in February 2024 to facilitate knowledge exchange within the biosurveillance community, by showcasing the biosurveillance work that has been undertaken, whilst also creating an opportunity for people to connect.

V. 100 Days Mission

22. The 100 Days Mission (100DM) was launched under the UK's 2021 G7 presidency. The 100DM aims to better prepare the world for the next pandemic by pre-emptively and proactively driving the development of diagnostics, therapeutics and vaccines so that they can be rapidly made available within the first 100 days of an epidemic or pandemic threat being identified.

23. In support of the 100DM, the UK has identified the UK Health Security Agency (UKHSA) as the UK national secretariat, who will work alongside the Department for Health and Social Care (DHSC), the Food Standards Agency (FSA), the Animal and Plant Health Agency (APHA), and other appropriate agencies to make progress on the ambitions of the 100DM. This includes strengthening and securing surveillance, diagnostics, therapeutics and vaccines (DTV) research and development, manufacturing, clinical trials and regulation, and financing, all of which could be relevant capabilities to implementation of BTWC Article VII.

24. Progress so far includes:

- Advancing genomic science and technology for **National Health Service** (NHS) delivery and protecting public health as a core capability across the world. These include UKHSA's genomics capability, which allows rapid identification and surveillance of different pathogens, including SARS-CoV-2, a range of gastrointestinal pathogens (*Salmonella*, *Listeria* and *E. coli*), a range of influenza viruses, including seasonal and avian influenza (H5N1), and multidrug-resistant tuberculosis (MDR-TB).

[5] **PATH SAFE** Programme: https://www.food.gov.uk/our-work/pathogen-surveillance-in-agriculture-food-and-environment-path-safe-programme.

- The creation of a **Vaccine Development and Evaluation Centre (VDEC)** to support the development and laboratory (*in vivo* and *in vitro*) evaluation of new vaccines and vaccine technologies as part of pandemic preparedness efforts.[6]
- The launch of the **New Variant Assessment Platform (NVAP)** in 2021. NVAP is a global genomic surveillance programme, which was initially offered of UK capacity in support of countries wanting to build their capacity and capability to effectively identify, assess and track new SARS-CoV-2 variants. The initiative is now expanding to cover other pathogens such as tuberculosis and controlling risks associated with AMR. Support includes training, equipment and reagents, and direct access to sequencing capacity in the UK to increase regional capacity and capability on genomic surveillance, improve sequencing quality, and help improve reporting and data sharing on variants and pathogens of pandemic potential.[7] NVAP is committed to making data available globally through the Global Initiative on Sharing All Influenza Data (GISAID). This allows NVAP to inform both UK risk assessment and pandemic control strategies globally. Countries can access support via the website detailed in this paper.

VI. Conclusions

25. UK capacity for assistance, preparedness and response to biological incidents, whether naturally occurring, accidental or deliberate in origin could provide relevant capabilities to the implementation and operationalisation of Article VII. The UK provides offers of assistance in this regard in the interactive database for Article X. In addition, the UK is open to discuss other assistance requests on the theme of Art VII, assistance, preparedness and response to biological incidents.

26. Strengthening global capacity to prepare for and respond to biological incidents of any origin is relevant across public health, animal health, crop health and the environment. Therefore, as the UK has outlined in this paper, taking a One Health approach to capability development will improve preparedness and response from potential harmful releases of biological agents and can also act as a deterrent to their misuse and misapplication.

27. The UKPHRST is the UK's primary rapid response capability to provide assistance and support to infectious disease outbreaks anywhere in the world at short notice. This unit has provided and will continue to provide lifesaving emergency response to infectious disease outbreaks. The importance of working closely with other aspects of the emergency response architecture such as WHO's GOARN is recognised as a core element of an effective global biological incident response capability.

28. An enhanced UK microbial forensics capability (as part of the wider UK Biological Security Strategy) will help mitigate the effects of a biological incident and bolster investigative capacity across a multisector landscape.

29. PATH-SAFE is a UK wide and cross government programme developing a national surveillance network to improve the detection and tracking of foodborne human pathogens and AMR throughout the UK's agricultural and food system. This project is specifically incorporating a One Health approach and presents an illustrative example of how a tailored One Health capability could provide assistance and response to biological incidents affecting human, animal and agricultural health.

30. In response to the COVID-19 pandemic, the UKHSA led 100DM was established to expedite the development and rollout of vaccines during a large scale infectious disease outbreak. Such a capability demonstrates the importance of bringing together vaccine research and manufacturing capacities to strengthen domestic and global responses to biological incidents.

[6] **VDEC:** https://www.gov.uk/guidance/ukhsas-vaccine-development-and-evaluation-centre-vdec
[7] **New Variant Assessment Platform:** https://www.gov.uk/guidance/new-variant-assessment-platform

VII. Recommendations

31. The UK recommends that BTWC States Parties in a position to do so take a One Health approach to assistance, preparedness and response to biological incidents, whether their origin is natural, accidental or deliberate.

32. The UK recommends that States Parties in a position to do so work collaboratively with one another, and with International Organisations such as the WHO, WOAH, UN FAO and UNEP to build capacity for responding to biological incidents affecting human, animal and plant health and the environment.

33. The UK recommends that States Parties in a position to do so consider including their national capabilities relevant to Article VII as offers of assistance in the interactive cooperation and assistance database under the emergency response and assistance category. Such capabilities are relevant to the strengthening and operationalisation of Article VII.

34. The UK recommends that States Parties work together to achieve the mandate of the Working Group and establish a science and technology (S&T) review and international cooperation and assistance mechanisms for the BTWC. Both would support implementation of Article VII, as recently illustrated in UK working paper 9 from the ninth Review Conference.[8]

[8] **BWC/CONF.IX/WP.9** - Advances in Science and Technology: Impact on Response to the COVID-19 Pandemic and Relevance to Article VII of the Biological and Toxin Weapons Convention – Submitted by the United Kingdom of Great Britain and Northern Ireland