

**Ninth Review Conference of the States Parties  
to 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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English only

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Geneva, 28 November – 16 December 2022

Item 10 of the provisional agenda

**Review of the operation of the Convention  
as provided for in its Article XII**

**Implementation of Article X of the Convention**

**Background information document submitted by the Implementation  
Support Unit**

*Summary*

The Preparatory Committee decided to request the Implementation Support Unit (ISU) to prepare a background information document on the implementation of Article X, to be compiled from information submitted by States Parties, including information submitted pursuant to paragraph 61 of the Final Declaration of the Seventh Review Conference (see BWC/CONF.IX/PC/10, paragraph 35(h)). The ISU duly requested submissions from States Parties, and all submissions provided to the ISU by 30 November 2022 are included in this document. Any further submissions from States Parties will be included in an addendum to this document. The information in this document is reproduced as submitted by States Parties, in some cases with minor editing. Information submitted in official languages other than English has been translated into English.



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## China

### I. Bilateral cooperation

#### A. In the human health field

1. China is committed to strengthening exchanges and cooperation in the fields of infectious disease prevention and control and of health emergency response. Since the outbreak of the novel coronavirus (COVID-19) epidemic, China has persisted in working in solidarity with the international community, comprehensively promoting international cooperation in combating the epidemic and carrying out the world's largest emergency humanitarian operation. It has provided hundreds of billions of anti-epidemic items, such as masks, protective clothing and ventilators, to 153 countries and 15 international organizations; shared epidemic prevention and control and diagnosis programmes with 180 countries and more than 10 international and regional organizations; and dispatched 38 medical expert groups to 34 countries. A total of 1,073 Chinese medical teams stationed in 54 countries are on the front line of the fight against the epidemic. China was the first to share information on the complete genome of the novel coronavirus, regularly informing the World Health Organization (WHO) and the countries concerned with regard to the outbreak, and has hosted several WHO international expert groups visiting China to conduct research on epidemic prevention and control and virus traceability, contributing to global epidemic prevention and control.

2. China is committed to bridging the immunization gap and is the largest contributor to the equitable distribution of vaccines. Early in the outbreak, Chinese President Xi Jinping proposed that the novel coronavirus vaccine should become a global public good. To date, China has supplied more than 2.2 billion vaccine doses to more than 120 countries and international organizations. China was the first country to support intellectual property rights exemptions for vaccines, and took the lead in transferring the technology to developing countries. To date, China has carried out production cooperation with 21 countries, and its annual overseas production capacity has reached 1 billion doses. China supports the central coordinating role of WHO, prioritizes the procurement needs of the COVID-19 Vaccine Global Access (COVAX) Facility, and has supplied over 200 million doses of vaccines to the Facility.

3. China actively helps developing countries to strengthen their health system construction as well as their professional and technical personnel capacities. The National Health Commission of China coordinates funds and resources and tasks the Chinese Center for Disease Control and Prevention, the Chinese Center for Health Development Studies and the provinces of Yunnan and Guangxi with carrying out practical cooperation with neighbouring and related developing countries in the fields of prevention and control of infectious diseases and health emergency response.

4. The National Health Commission of China coordinated with experts from the Chinese Center for Disease Control and Prevention (China CDC) to assist Serbia in the construction of a biosafety level 3 (BSL-3) laboratory and provided technical support for testing, monitoring and personnel training; that laboratory undertook the task of testing about 35 per cent of the COVID-19 virus samples in Serbia. Similar guidance was provided for the technical cooperation project implementing the BSL-3 China-Sierra Leone Friendship Biological Safety Laboratory, which undertakes about 25 per cent of that country's COVID-19 virus-sample testing tasks.

5. The China International Development Cooperation Agency has implemented aid projects with the China-Cambodia Preah Kossamak Friendship Hospital, Tboung Khmum Provincial Hospital, Lao Mahosot General Hospital, Luang Prabang Hospital and the Myanmar country office of the Centers for Disease Control and Prevention (United States CDC), and actively promoted projects involving the Viet Nam Traditional Medical College, CDC Cambodia and malaria control in the China-Myanmar border areas.

6. China has implemented more than 20 foreign-aid study and training projects in the areas of infectious disease prevention and control, inspection and quarantine, medical technology and other specialties, and trained more than 860 people.

7. China supports China-Africa public health cooperation projects. The National Health Commission, the International Development Cooperation Agency, the Ministry of Commerce and other departments implement cooperative projects for the prevention and control of new and recurring communicable diseases, schistosomiasis, HIV/AIDS and malaria in Central Africa. Through its support of multilateral projects such as the China-United Kingdom-Tanzania and China-Gates Foundation-Tanzania Malaria Control Projects, as well as bilateral projects such as the Cooperation Project on Malaria Prevention and Control in Central Africa, the National Health Commission bolsters local malaria prevention and control capabilities, facilitates African localization of Chinese experience and products, and supports relevant African countries in accelerating malaria control and eradication processes. China actively assists the Zanzibar Schistosomiasis Control Project and the China-Africa Schistosomiasis Prevention and Control Cooperation Project, promoting Chinese experience and key technologies for the control of schistosomiasis, and enhancing local schistosomiasis prevention and control capabilities.

8. China is also actively strengthening cross-border health emergency cooperation. Five Chinese international emergency medical rescue teams have succeeded in obtaining WHO certification to carry out seismic emergency medical rescue and health emergency training in Nepal, and have comprehensively optimized disaster medical rescue levels and health emergency cooperation mechanisms in neighbouring countries.

9. The Chinese Academy of Sciences has conducted project exchanges and cooperation with scientific academies and research institutions in Australia, Belgium, France, Russia, the United States of America and other countries. It has established 10 overseas science and education cooperation centres to carry out cooperative research on the prevention and control of infectious diseases, and has established the Alliance of International Science Organizations (ANSO) under the Belt and Road Initiative, which has grown to 67 members covering 50 countries and regions in Asia, Africa, Europe, North America, South America and Oceania, promoting the establishment of such international biosafety thematic networks as an alliance for the transformation of infectious disease clinical medicine and a health big data alliance.

10. Since 2017, the Chinese Academy of Sciences, supported by the Wuhan Institute of Virology, has organized five international training courses on laboratory biosafety management and technology for research talent in infectious disease prevention and control for many countries, especially developing countries. To date, more than 400 participants from nearly 40 countries, including Bangladesh, Brazil, Cambodia, Egypt, Greece, Hungary, Kazakhstan, Kenya, Myanmar, Nigeria, Pakistan, Poland, Serbia, Sri Lanka and Thailand, have participated in the training.

## **B. In the animal health field**

11. Within the purview of such international organizations as the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO), China has actively strengthened China-Japan-Republic of Korea, China-Laos-Myanmar, China-Viet Nam, and China-Mongolia-Russia cooperation frameworks for the prevention and control of transboundary animal diseases, strengthening information exchange and improving collaboration mechanisms.

12. The Ministry of Agriculture and Rural Affairs of China has formulated criteria for assessing the equivalence of African swine fever (ASF) management measures localized by region, which promoted cooperation with relevant countries in localizing ASF management in accordance with the principles of mutual recognition of standards, reciprocity of measures and synchronization. Work on localizing ASF management and mutual recognition of biosafety isolation standards was completed in 2021. In 2019, Central University of Mindanao, Philippines, sent staff to the China-OIE Swine Fever Reference Laboratory for training in swine fever diagnosis and monitoring techniques.

13. China cooperates closely with the international community and actively makes full use of its technological advantages in the field of veterinary drugs. For more than ten consecutive years, the China Institute of Veterinary Drug Control has carried out technical exchanges and cooperation with the French Agency for Veterinary Medicinal Products, closely cooperating on veterinary drug assessment and evaluation, quality supervision and testing techniques. Since 2017, China has successively signed memorandums of cooperation in the areas of veterinary drugs and the prevention and control of animal diseases with the Biosafety Institute of the Kazakhstan Ministry of Science and Technology and with the Ministry of Agriculture, Forestry and Quarantine of the Republic of Korea, strengthening the competitiveness of the veterinary drug industry.

## **II. Multilateral and regional cooperation**

14. China attaches great importance to regional and multilateral cooperation with relevant international organizations such as WHO, OIE and FAO.

### **A. In the human health field**

15. China has actively promoted and assisted work related to the construction of the headquarters of the African Union Centres for Disease Control and Prevention (Africa CDC). Through the implementation of cooperative projects for the prevention and control of new and recurring communicable diseases in Central Africa, donation of medical supplies and sharing of technical guidelines, it has helped Africa CDC combat the epidemic.

16. China actively participates in cooperation among the Association of Southeast Asian Nations (ASEAN) Emergency Operations Centre (EOC) Network for Public Health, the ASEAN Expert Group on Communicable Diseases and the Mekong River Basin Disease Surveillance (MBDS) Network.

17. Relying on public health cooperation networks under the Belt and Road Initiative such as the Tropical Medical Alliance, the Echinococcosis Prevention and Control Alliance and other mechanisms, China has strengthened cooperation with Mekong countries (on HIV/AIDS, malaria, dengue fever, plague, etc.) and Central Asian countries (on echinococcosis, plague, etc.) in the prevention and control of infectious diseases.

18. By the end of March 2022, the National Health Commission of China had communicated information on the epidemic nearly 3,000 times to the international community, including WHO and the relevant countries and regional organizations of the Belt and Road Initiative. Numerous technical documents on such topics as outbreak prevention and control, as well as diagnosis and treatment programmes, had been shared with more than 100 countries and more than 10 international and regional organizations worldwide. More than 200 technical exchanges with such international and regional organizations as the African Union, ASEAN, the European Union, the Shanghai Cooperation Organization (SCO) and WHO, as well as France, Germany, Japan, the Republic of Korea, Russia, the United States and ASEAN and South Pacific island countries, were carried out through various means such as expert seminars or remote meetings.

### **B. In the animal health field**

19. China has further promoted the establishment of a cooperation platform with OIE. Adhering to the principle of “timeliness, openness and transparency”, China provides timely notification on outbreaks to the Organisation. Since 2016, China has submitted urgent reports to OIE on 64 major outbreaks, including 17 cases of ASF, 15 cases of foot and mouth disease (FMD), 26 cases of highly pathogenic avian influenza and 6 cases of bovine lumpy skin disease.

20. China and OIE have signed a memorandum of understanding on optimizing the use of Chinese donations. Within the framework of the Organisation, China participates broadly in tracing the origins of such animal diseases as ASF and avian influenza, and in drafting and revising OIE international animal health rules and standards. China actively translates, publishes and promotes OIE international standards, such as the OIE Terrestrial Animal

Health Code, Aquatic Animal Health Code, *Manual of Diagnostic Tests for Aquatic Animals* and *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*, and promotes the upgrading of domestic prevention and control technology in China. OIE has confirmed for many years that China is free of bovine spongiform encephalopathy), contagious bovine pleuropneumonia and African horse sickness.

21. China uses the OIE South-East Asia and China Foot and Mouth Disease (FMD) Campaign and other platforms to strengthen its cooperation with Laos, Myanmar, Viet Nam and other neighbouring countries in preventing and controlling FMD epidemics in South-East Asia and to promote international trade in regional animals and animal products. At present, China has become the main funder of the programme.

22. Under the Initiative for ASEAN Integration, with a view to helping ASEAN countries improve animal disease prevention and control, diagnosis and monitoring capabilities and support ASEAN integration, China has launched an animal disease laboratory project to aid ASEAN, assisting in building one animal disease laboratory each in Phnom Penh, Cambodia, and Naypyidaw, Myanmar, providing related laboratory equipment and organizing personnel training. The project has fully entered the implementation phase.

23. China has further strengthened its cooperation with FAO. Launched in 2010, the China-FAO Field Epidemiology Training Programme for Veterinarians has undertaken extensive international exchange and cooperation. More than 40 core trainees have participated since 2016. To implement FAO emergency assistance projects, they have brought veterinary science and technology to the countryside in five provinces or districts, including Anhui; surveyed and visited more than 300 farmers in 13 townships or villages; and distributed more than 15,000 informational materials to farmers, herders and livestock breeders on preventing and controlling such diseases as ASF and brucellosis.

24. In 2018, China and FAO signed the China-FAO South-South Cooperation Project on Transboundary Animal Disease Control in the Greater Mekong Subregion, aimed at strengthening the prevention and control of animal diseases in the Belt and Road Initiative region. Regional joint prevention and control mechanisms established by China and FAO, together with Laos, Myanmar, Cambodia, Viet Nam and Thailand, serve to enhance border animal mobility management capabilities and safeguard trade security and public health. At the request of international organizations such as FAO, China has organized experts to assist in dealing with epidemics and assessing the creation of disease-free zones in Viet Nam, Laos and other neighbouring countries.

25. China has recently added an OIE Swine Fever Reference Laboratory, an OIE-FAO Reference Laboratory for Brucellosis, an FAO-OIE Rinderpest Holding Facility, and an FAO Reference Centre for Peste des Petits Ruminants (PPR).

26. Since 2016, China has successfully organized an OIE Asia-Pacific regional short-term workshop on control and diagnosis of swine diseases, FAO-OIE PPR regional road map meetings, an international workshop on the development of veterinary epidemiology, an international symposium on swine fever prevention and control technology, an international workshop on the prevention and control of African swine fever and an international academic exchange on brucellosis, thus actively carrying out exchanges and cooperation with international counterparts on animal disease prevention and control.

### **III. Peaceful uses and related international cooperation**

27. China is committed to promoting peaceful uses and related international cooperation and actively contributes its own proposals. Within the framework of the Convention, in 2016 China and Pakistan launched an initiative to establish a mechanism for non-proliferation export control and international cooperation. Within the framework of the General Assembly, a resolution proposed by China on promoting international cooperation on peaceful uses in the context of international security (resolution 76/234) was adopted in December 2021 at the seventy-sixth session of the General Assembly. The resolution aims to initiate a dialogue process within the General Assembly framework, safeguard the legitimate rights and interests of all countries in the peaceful use of science and technology, promote the benefits of

inclusive sharing of scientific and technological progress and address the security challenges posed by the development of science and technology. China will work with all parties to facilitate the follow-up process under the resolution.

28. Within the framework of the Convention itself, China is deeply involved in the discussion on enhancing the implementation of article X of the Convention, and actively supports a series of initiatives put forward by the Movement of Non-Aligned Countries in such areas as prioritizing the full, effective and non-discriminatory implementation of article X, calling upon the developed countries to eliminate restrictions on peaceful uses, drafting a plan of action for the implementation of article X and establishing an open mechanism within the framework of the Convention to facilitate the implementation of article X. China is committed to providing the international community with biosafety public goods and supports the establishment and continuous improvement of a database on assistance and cooperation in accordance with article X of the Convention.

## Colombia

### I. Article X of the Convention states that

*“The States Parties to this Convention undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes. Parties to the Convention in a position to do so shall also cooperate in contributing individually or together with other States or international organizations to the further development and application of scientific discoveries in the field of bacteriology (biology) for the prevention of disease, or for other peaceful purposes.”*

### II. Compliance

29. In October 2017, further to article X of the Biological Weapons Convention, a joint peer review was conducted with Chile, with the objective of sharing national experiences relating to the implementation of Security Council resolution 1540 (2004) and, at the same time, establishing cooperation in this area.

30. The United Nations Office for Disarmament Affairs and the Inter-American Committee against Terrorism of the Organization of American States (OAS) supported and were present during this exercise, the first in the hemisphere and the third worldwide.

31. It reflects the excellent relationship between the two countries, which are both dedicated to adherence to legal instruments and international institutions, and to their commitment to the regimes for disarmament and for the non-proliferation of weapons of mass destruction.

32. The results of the exercise were presented to the Security Council Committee established pursuant to resolution 1540 (2004) (S/AC.44/2018/3).

33. As is evident in document S/AC.44/2018/3, this review has allowed the countries to appreciate the differences in their approaches to and existing capacities for the implementation of resolution 1540 (2004), thereby enabling each country to assess more clearly its strengths and weaknesses in the face of the threat posed by weapons of mass destruction, including biological weapons, and to better focus its bilateral cooperation efforts.

34. Recognizing the importance of the resolution, as well as the linkage with processes under the Convention, Colombia decided to be part of the OAS Inter-American Committee against Terrorism project to strengthen biosafety and biosecurity in Latin America in line with resolution 1540 (2004) on the non-proliferation of weapons of mass destruction and their means of delivery.

## Cuba

35. Cuba emphasizes the importance and necessity of the full, effective and non-discriminatory implementation of article X of the Convention for the economic and technological development of all States parties. Compliance with the provisions of article X is fundamental to achieving the object and purpose of the Convention and could have tangible benefits for all in the field of biology for peaceful purposes.

36. The economic, commercial and financial embargo imposed on Cuba by the Government of the United States of America is an obstacle to international cooperation within the scope of the Biological Weapons Convention.

37. The unilateral coercive measures, which include laws with an extraterritorial component that are enforced by the Government of the United States to the detriment of Cuba, constitute a violation of article X of the Convention, under which States undertake to facilitate “the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes” and to do so “in a manner designed to avoid hampering the economic or technological development of the States parties to the Convention or international cooperation in the field of peaceful bacteriological (biological) activities”.

38. It is inadmissible that the United States Government has tightened the embargo even against the backdrop of the difficult situation created by the coronavirus disease (COVID-19) pandemic and that, despite reiterated calls by the international community, the United States continues to limit, restrict and even, in many cases, prohibit the free exchange of equipment, technologies, materials and scientific and technological information for peaceful purposes by Cuba and other States parties, an exchange that is, without exception, a right of all.

39. Under the present conditions, the embargo is a huge burden for the Cuban people and economy, with particularly devastating effects in the midst of the COVID-19 pandemic. Cuba has been forced to set aside considerable resources to urgently secure the necessary equipment and materials for its national health system.

40. The losses that were incurred from the imposition of the embargo nearly six decades ago to December 2020 amounted to more than \$147.853 billion at current prices. Taking into account the fall of the dollar against the price of gold on the international market, the embargo has caused quantifiable losses of more than \$1.378 trillion.

41. The embargo imposed by the United States limits access to technologies or components with more than 10 per cent of content originating in the United States, a limitation that has negative effects on scientific and technological development for peaceful purposes. Because of the tightening of the embargo, German and other companies stopped supplying Cuba in 2020, and, as a result, between April and December 2020, the country no longer had access to a total of 32 kinds of equipment and supplies related to the production of COVID-19 candidate vaccines or the completion of clinical vaccine trials.

42. Cuba had to resort to other suppliers as intermediaries, which, as it was impossible to enter into a contract directly with the manufacturer, led to markups of 50 to 65 per cent above normal established prices. This situation had an impact on the work of several institutions in the biopharmaceutical sector in Cuba, including the Centre for Genetic Engineering and Biotechnology, the Finlay Vaccine Institute, the Empresa Laboratorios AICA (AICA Laboratories Company) and the import-export company FarmaCuba, which are directly involved in the country’s efforts to tackle the pandemic and other tropical infectious diseases.

43. Despite these enormous obstacles and limitations, the work done by Cuba to combat the pandemic has been internationally recognized. The country has three vaccines and has deployed more than 50 medical brigades to support the fight against the pandemic in 40 countries and territories.

44. The products of the Cuban biopharmaceutical industry, biotechnological products in particular, are among the main items that, because of their novelty, their high added value and the existence of potential demand in the United States, could enter the United States



market. However, the embargo prohibits United States citizens from directly benefiting from biotechnological and pharmaceutical products developed in Cuba. Every year, research, development, production and product commercialization in this sector are harmed, and the harm leads to considerable economic losses. Losses between April 2019 and March 2020 were estimated to amount to around \$161 million.

45. The Cuban State and its people cannot continue to be prevented, with impunity, from gaining access to equipment and materials that are necessary for their scientific and technological development or from using biological agents for peaceful purposes. These resources also contribute to the work of the country's Henry Reeve medical brigades, which specialize in responding to disasters and serious epidemics such as Ebola or the ongoing pandemic.

46. Cuba reiterates its firm commitment to the strict application of the Convention in all its aspects, including the full and effective application of article X, and calls for the unilateral and unconditional lifting of the United States embargo, in compliance with the 29 resolutions adopted by the international community at the United Nations General Assembly, the States Members of which call for an end to this absurd policy.

## **Finland**

### **I. Specific Endeavours Relevant to Article X**

47. At the BWC 2020 Meeting of Experts Finland chaired the working group on the Cooperation and Assistance (MX1).

### **II. Global Health Security Agenda**

48. Finland remains an active member of the Global Health Security Agenda (GHSA). Finland is a member of the GHSA Steering Group and continues its active engagement in the country evaluations. The second five-year period of the GHSA programme will run until the end of 2023. Through partnership of more than 50 nations, international organizations, and non-governmental stakeholders, GHSA is to prevent, detect and respond to infectious diseases by facilitating collaborative, capacity-building efforts to achieve specific and measurable targets around biological threats, while accelerating achievement of the core capacities required by the relevant global health security frameworks.

49. During its year as a GHSA chair in 2015 Finland initiated the GHSA country evaluation processes, which seeks to measure a state's capacity to respond to a potential health security threat. The GHSA tool was adopted as the base of WHO's Joint External Evaluation-tool, adopted in 2016. Currently, 116 JEEs have been conducted and these have been followed up by more than 70 national actions plans for health security. Finland's JEE was conducted in 2017. Finland is also, together with Australia, leading an Alliance of interested countries and organizations in support of the external evaluations in order to better link assessments with national planning and development financing.

50. During the Covid-19 pandemic, a number of processes have been established at WHO to review the lessons and prepare for future biological health threats. Finland participates in the negotiations of a new agreement on pandemic prevention and preparedness and the possible amendments to the International Health Regulations (2005).

### **III. Participation in Global Partnership**

51. Finland is actively involved in the international cooperation initiative Global Partnership, which functions as part of G7-cooperation. The Global Partnership addresses nonproliferation, disarmament, counterterrorism, and nuclear safety issues through cooperative projects.

#### **IV. Strengthening Biosafety and Biosecurity in Tanzania**

52. The Ministry for Foreign Affairs of Finland has funded a project on biosafety and biosecurity in Tanzania since 2014. The project aims at preventing unintentional and intentional spread of infectious diseases by strengthening the know-how of diagnosing. The existence and outbreaks of diseases that are dangerous to life place great strain to the national healthcare systems. Efforts to identify microbes that cause infectious diseases are vital to any nation's public health system. The Finnish Centre for Biothreat Preparedness (BUOS)/Center for Military Medicine (SOTLK) administers and implements the biosafety and biosecurity project, together with the Tanzanian counterpart (Ministry of Livestock and Fisheries Development). Local expertise, detection abilities and developing of biosecurity know-how reduces potential bio threat, thus contributing towards building global security.

#### **France**

53. The covid-19 pandemic, with its highly disruptive effect on our societies, has recalled the importance of the biological issue that the international community is confronted to. Due to its potentially worldwide impact, the biological issue is a global challenge that must be tackled in all its dimensions: sanitary, economic and social, safety but also industrial and innovative.

54. In this regard, research, production and innovations in civil biological field induce biosafety and biosecurity stakes. Indeed, civil biological activities are rapidly growing, notably in the research field of biotechnologies.

55. To face these challenges, France proposes to its partners of the Convention a collaborative project in the form of on-line library on biosafety and biosecurity. It could take the form of a multidisciplinary digital area dedicated to biosafety and biosecurity: SecBio.

56. SecBio is intended to be a development support tool in the field of biosafety and biosecurity. In this respect, this project contributes to the implementation of the Biological and Toxin Weapons Convention (BTWC). In particular, this project is in line with the provisions of Article X of the Convention in that it aims to facilitate the exchange of information for peaceful purposes.

57. SecBio is intended to be an international online platform for biosafety and biosecurity. It is an interactive tool to inform, train and connect biosafety and biosecurity stakeholders. The online Platform will be accessible to all States Parties and international organizations which will be able to both use the Platform and nourish it. The Platform is intended to be available in all six official UN languages.

58. There are three main features within SecBio:

- i. a searchable repository for biosafety and biosecurity legal framework, treaties, laws, regulations, case law, norms, standards and best practices, as well as scientific publications;
- ii. a learning module for users to build a project and challenge their knowledge;
- iii. a forum for expert's networking to exchange information, data and best practices.

59. The use of this tool by States Parties could allow the Platform to become the international reference on the issue and therefore increase the global biosafety and biosecurity level playing field.

#### **Mexico**

60. In keeping with its commitments to the non-proliferation of weapons of mass destruction and to international disarmament and security, and in connection with the preparatory work for the Ninth Review Conference – specifically, in response to the decision adopted by the Preparatory Committee for the Ninth Review Conference on 20 December

2021 and the request by the Implementation Support Unit for States parties to contribute to the preparation of a series of supporting documents on their implementation of article X – the Government of Mexico provides the following information:

61. Mexico considers it essential to promote multilateral cooperation with a view to making the making the response to and management and mitigation of possible crises or emergency situations more robust and to reducing the inequalities between the countries that are more highly developed scientifically and technologically and those that are in the process of developing their scientific and technological capacities.

62. In this regard, Mexico, making use of the National International Health Regulations Focal Point, shares epidemiological information on events with the potential to constitute public health emergencies of international concern.

63. Against the backdrop of the coronavirus disease (COVID-19) pandemic, the Mexican National Laboratory worked together with national public health laboratories in Central America to ensure timely detection of COVID-19, as well as the shipment of samples and the implementation of the protocol for molecular identification of the COVID-19 virus.

64. Mexico also has a joint technical task force with the United States that serves as a forum for the discussion of technical issues related to public health and the promotion of joint work in areas of mutual interest such as the investigation of outbreaks, technological progress in the laboratory diagnosis of infectious diseases, training and the monitoring of epidemics.

65. Mexico maintains its full willingness to exchange information on strategic processes, as well as scientific and technological information, and to take part in technical training exchanges with States parties, to the extent possible, without affecting the substantive operations of the States parties' diagnostic, research and reference laboratories.

66. These exchanges take place on the understanding that they should contribute to the development and production of innovative and preventive medical measures control and treatment of biological agents and that any scientific and technological progress relevant to the Convention should be part of the exchange.

67. Against this backdrop, Mexico supports the proposal of the French Government for the multidisciplinary digital platform referred to as SecBio, the objective of which is to facilitate the exchange of information for peaceful purposes by setting up a legal repository for biosafety and biosecurity matters as well as for scientific publications and by using the platform as a learning module and a forum for the creation of networks of experts in the field for the exchange of best practices.

68. For Mexico, it is essential for the Biological Weapons Convention to create synergies with other organizations such as the World Health Organization, the Food and Agriculture Organization of the United Nations, the World Organization for Animal Health and other relevant regional and international mechanisms if it is to be fully and effectively implemented. The aim is also to develop sustainable public policies robust enough to reassure the international community, as well as to prevent the appropriation of this technology and type of weaponry by unauthorized actors.

69. Mexico believes that resources for cooperation should not be limited to financial resources; exchanges of information, experiences, lessons learned and best practices, as well as educational exchanges and the exchange of technical knowledge, which are necessary complements to traditional assistance arrangements, should also be encouraged.

## **Qatar**

70. Background document concerning the compliance of the State of Qatar with its obligation to implement article X of the Convention.

71. Qatar remains firmly committed to the fulfilment of all its obligations under the Biological Weapons Convention and, in particular, attaches great importance to the full and effective implementation of the provisions of article X the Convention.

72. The State of Qatar supports the full, effective and non-discriminatory implementation of article X as an integral and fundamental part of compliance with the Convention. It also supports the proposal of the Non-Aligned Movement with regard to article 10, which was presented at the Eighth Review Conference ([BWC/CONF.VIII/WP.23](#)).

73. Qatar has improved its own capabilities in the field of biological sciences and technology for peaceful purposes and places great emphasis on international cooperation in that field. This approach is in line with article X, wherein States parties are enjoined to commit to partnership, assistance, the exchange of information and the development of mutually beneficial outcomes.

## **I. A general overview of the implementation of article X by the State of Qatar**

74. Qatar cooperates closely with a large number of countries in the health and medical sector and has an ongoing cooperation programme with the World Health Organization (WHO) regarding the development of technologies for monitoring, diagnosing and combating disease. With the spread of infectious diseases such as COVID-19, the Centre for the Control of Infectious Diseases in the Ministry of Health has, in cooperation with WHO, been reviewing the epidemiological situation in Qatar, treating emergency cases and advising on response and surveillance procedures.

75. Qatar provides the relevant information in the confidence-building reports it submits annually to the United Nations Office for Disarmament Affairs (UNODA)

76. Qatar supports greater cooperation between competent international organizations regarding the peaceful use of biological and toxic agents. Moreover, Qatar has constantly and regularly reported outbreaks of infectious diseases, not only those for which notification is mandatory but also resurgent and novel diseases.

77. Qatar has made every effort to cooperate with expert partners abroad on advanced technologies to monitor, detect and diagnose highly infectious diseases, as well as factors that might cause disease in humans and animals.

78. The National Arms Prohibition Committee has run several training courses over recent years in partnership with various State and governmental sectors as well as with academic institutions, universities and schools.

79. In the area of preparedness and crisis management, the National Arms Prohibition Committee has set up a team of specialists to respond to biological disasters at the national level, with preventive measures against biological attacks and information on how to respond to bioterrorism. In addition to this, the authorities have cooperated with the Bioterrorism Prevention Unit of the International Criminal Police Organization (INTERPOL) in the roll-out of the “Biosafe” programme. The aim is to exchange experiences regarding the prevention of biological attacks and to develop a national biosafety team representing governmental and quasi-governmental sectors that work with biological agents to provide emergency responses to any individual or victim during catastrophes.

80. As part of the implementation of article X of the Convention by the State of Qatar, the country’s medical, biological and academic institutions duly monitor all scientific and technological developments relevant to the Convention, provide support and backing for research into applied biology and encourage peaceful international cooperation on science and technology. They also participate in the exchange of information in the field of biology by attending scientific conferences and workshops.

81. As concerns health and disease prevention in animals, a number of training programmes have been organized in Qatar by the Ministry of Health and the Ministry of Municipality, in cooperation with the Embassy of the United Kingdom of Great Britain and Northern Ireland. The programmes, held under the slogan “One Health Approach” were attended by experts in the fields of animal, plant and human health.

82. International exchanges in science and technology constitute an important part of the fulfilment of article X of the Convention. The COVID-19 pandemic has demonstrated the

need to pursue international cooperation to facilitate such exchanges vis-à-vis access to equipment and materials, to diagnostic samples, to medicines and vaccines, and to visits by scientists in order to train researchers in areas of science that are of concern to both the scientific and the international communities.

83. In conclusion, Qatar hopes that the Conference will lead to a vision and will achieve progress towards the plan of action envisaged in recommendations of the Eighth Review Conference and in the recommendations of subsequent annual meetings of the States parties to the Convention. Qatar reaffirms that its own delegation is ready to participate in and ensure the success of the Conference.

## **Republic of Korea**

### **I. Cooperation with the United Nations, the World Health Organization, and the International Atomic Energy Agency**

84. The Korea Disease Control Agency (KDCA) cooperates with international organizations to strengthen its capabilities in detecting, evaluating, reporting, and responding to public health threats to prepare for potential public health crises. For example, the KDCA and the World Health Organization's Regional Office for the Western Pacific signed a memorandum of understanding from 2016 to June 2022 regarding a Field Epidemiology Training Program to:

- build capacity in event-based surveillance and rapid risk assessment for implementation;
- prepare the program's alumni to contribute to public health emergencies, such as increasing surge capacity when public health events occur in the Western Pacific Region; and,
- establish a network of fellows in the Western Pacific Region for future collaboration.

85. The ROK supports activities of the Committee on United Nations Security Council Resolution 1540. The ROK shared recent developments in the ROK's export control system at the regional Wiesbaden Conference in 2017, 2018, and 2019. In 2018, the ROK hosted the 2nd United Nations Security Council Resolution 1540 Industrial Outreach Conference with support from the UN Office for Disarmament Affairs and the Government of the Federal Republic of Germany as part of the Wiesbaden Conference for the Asia Pacific region. The conference facilitated information exchange between regulators and industries to find ways to implement UNSCR 1540 (2004) effectively.

86. The ROK made an extra-budgetary contribution to the International Atomic Energy Agency (IAEA) of USD 1 million to support the global response to the pandemic in 2020. This contribution supports the IAEA's Zoonotic Diseases Integrated Action initiative to strengthen the preparedness and capabilities of countries to detect, diagnose, and monitor outbreaks of zoonotic diseases.

87. The ROK has accelerated research and development for Covid-19 therapeutics and vaccines, pledging 300 million dollars toward the ACT-A Initiative and 30 million dollars to the Financial Intermediary Fund of the World Bank, among others, thereby expanding its contributions to building a more robust global health architecture. In addition, the ROK will remarkably increase its contribution to Global Fund, joining forces with our partners in our fight against infectious diseases including AIDS, tuberculosis and malaria.

### **II. Global Health Security Agenda**

88. The ROK is a permanent member of the Global Health Security Agenda (GHSA) Steering Group and contributes to GHSA Immunization Action Package. In addition, the ROK will host a GHSA Ministerial Meeting of GHSA in Seoul, November 2022 which will also include a side event on the Biosafety Action Package as to provide opportunities to

strengthen and to widen the global laboratory network in the sphere of global health security. Also, the ROK government and the Korea International Cooperation Agency have supported capacity building in infectious diseases and laboratory management through projects such as the Development and Implementation of Activities Contributing to the GHSA in Cambodia (2017-2020, USD 3 million), the GHSA Strengthening Project in Ghana (2018-2021, USD 7.5 million), and the Master's Degree Program in GHSA Capacity Building.

### **III. Participation in Global Partnership**

89. Since 2005, the ROK has participated in the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction to contribute proactively to the efforts to prevent terrorists or states that sponsor terrorism from acquiring or developing weapons of mass destruction and related materials, equipment, and technology.

### **IV. Global Disease Eradication Fund**

90. The ROK established the Global Disease Eradication Fund (GDEF) for treating and preventing infectious diseases in developing countries in collaboration with non-governmental organizations, international organizations, and other international initiatives. One thousand KRW (approximately 0.6 USD) is levied on every international flight ticket departing from the ROK to fund the GDEF. Since 2017, the GDEF has been supporting various projects to strengthen the capacity for responding to infectious diseases, such as the WHO's Strengthening National Laboratory Systems and the Workforce for Surveillance of Emerging Threats Including Antimicrobial Resistance (2017-2022, USD 9.75 million), Building Resilient Health Care Services to Improve Emergency Preparedness (2018-2022, USD 5.84 million), and Promoting Global Health Security through Strengthened Capacities for Outbreak Prevention, Detection, and Response (2019-2023, USD 9.5 million), as well as core programs of other global health organizations, including the Coalition for Epidemic Preparedness Innovations (2020-2022, USD 9 million).

## **Republic of Serbia**

91. The Republic of Serbia attaches importance to the issue of international cooperation, i.e. to the effective and full implementation of Article X of the Convention in order to generate the benefits for the all State parties.

92. The enhancement of international cooperation is the vital interest of Serbian agencies/laboratories/institutions dealing with health, biosafety and biosecurity issues (Military Medical Academy — Institute of Epidemiology, BATUT Institute of Public Health, Torlak Institute of Immunology and Virology, Central Veterinary Laboratories of Serbia, Chamber of Biochemists, etc.).

93. One representative of the CBRN Centre participated in the International Conference "Global Biosecurity Challenges: Problems and Solutions", which was held in the Russian Federation (Sochi), from 23 to 28 June 2021. The aim of the conference was for participants to examine the current situation in the field of the provision of biosafety in the context of the COVID-19 pandemic, as well as experiences in responding to infectious threats and research issues. The main topics of the conference were perspectives and areas of joint cooperation in the field of biosafety, scientific and technical cooperation, exchange of experiences on the implementation of BTWC and preparations for the next review conference.

94. In the period from March 2020 until the end of 2021, personnel of the CBRN Centre with formation devices and equipment was engaged in biological disinfection and decontamination of people, vehicles, facilities of the Ministry of Defence and the Serbian Armed Forces, hotels, COVID hospitals and outpatient clinics, sports halls, gerontology centres, other facilities and communications on the entire territory of the Republic of Serbia.

95. Especially bearing in mind that the Republic of Serbia is seeking to create facilities with biological containment at biosafety level 3, by upgrading laboratories to meet BSL 3

and 4 standards and by training staff to operate at biosafety level 3. Our national experts are dedicated, skilled and responsible with the genuine desire to meet all biosafety and biosecurity requirements, but additional international expertise, as well as financial and technical assistance is needed and more than welcome. In the Republic of Serbia the maximum laboratory safety capacity is currently at level 2.

96. The standards of systems, processes and laboratories is important to Serbia because of our critical location at the gateway between east and west that is crucial to disease control in Europe, especially in the agriculture sector. Our objective is not only to upgrade the laboratories to meet higher BSL, but also to develop the laboratories standards to evaluate new facilities.

97. Our long-standing objective is to technically improve the general conditions in our facilities, which will help us to meet the higher standards for diagnostics, production, research and development.

98. The development of biotechnology and molecular biology cannot be stopped, but their application can be brought within the framework of ethical, moral and useful to man, by legal means.

99. A system of early warning, identification of the pathogenic agent and rapid reaction in crisis and emergency situations on a limited or wider territory, assessment of the spread and global consequences, as well as uniform action, in order to protect the population, is very important in terms of practical application.

100. It is necessary for certain procedures to be mandatory for all countries, which, according to their capabilities and technological development, will implement them, simultaneously using data exchange with other countries:

- Identification of infectious agents responsible for the unusual increase in patients
- Determining the origin of the agent (virus)
- Identifying the agent (causing agent)
- Analysis and interpretation of results
- Development of new technologies and improvement of data/file records
- Improving the analysis and interpretation of genetic data requires capacity and knowledge that are often beyond the expectations of most laboratories
- Employee education
- Special care is needed when creating instructions for the strain collection database
- Collective efforts to identify new opportunities to detect and confirm the use of "force" and identify responsibilities in the use of biological and biotechnological weapons
- The main goal for all countries is the fight against disease and the improvement of health
- Improvement of international cooperation
- Achieving biological security
- Advanced control of virulent pathogens
- Strict rules and control of import-export permits
- Control of possible dual purpose goods
- Improving the ability of states to respond in the event of a crisis/emergency situation in the event of a biosecurity incident and unifying criteria for risk assessment and response.

## **Saudi Arabia**

101. The Biological Weapons Convention underscores the importance of international cooperation regarding the use for peaceful purposes of bacteriological (biological) and toxic agents, equipment, resources and scientific and technological information for the effective and comprehensive implementation of the Convention.

102. The Kingdom of Saudi Arabia is eager to pursue international cooperation with a view to implementing article 10 of the Convention by sharing in the exchange of equipment, resources and scientific and technological information regarding those peaceful purposes. Saudi Arabia stands ready to cooperate in that field and to provide scientific information, if requested and depending upon available possibilities.

## **South Africa**

103. South Africa attaches importance to Article X and believes this Article can play an important role in improving human, animal and plant health in the world and further improving health capabilities to combat infectious disease in all countries. In this regard, the Cooperation Database can play a major role and it should therefore be improved in order to fulfil this important role.

104. South African institutes are involved in many cooperation programmes with other States Parties and International Organisations. These collaborative programmes include research activities, disease surveillance and diagnostics and other aspects of infectious disease management. South Africa greatly relies on these collaborations in order to improve its Public Health system, covering human, animal and plant health.

## **Sweden**

### **I. General remarks**

105. Sweden fulfills its obligations under Article X by facilitating and participating in the fullest possible exchange of equipment, materials and scientific and technological information for the use of biological agents and toxins for peaceful purposes, and by engaging in international cooperation. A number of Swedish agencies, universities, academic institutions and other entities contribute in this endeavour. The following report outlines some of Sweden's government-funded activities related to Article X during the period 2017-2021.

### **II. Swedish assistance contributions of relevance to Article X**

#### **A. Swedish International Development Cooperation Agency**

106. The Swedish International Development Cooperation Agency (Sida) is a government agency working on behalf of the Swedish government, with the mission to reduce poverty in the world. Through Sida's work and in cooperation with others, Sida contributes to implementing Sweden's Policy for Global Development. Sida cooperates with multilateral organisations, civil society organisations, public sector, research institutions and research-supporting organisations, and the private sector, in Sweden and abroad<sup>1</sup>. A large proportion of Sida's work in sectors such as agriculture, emergency response (see the Swedish Article VII report), food safety, health, and industry is of relevance for international cooperation and assistance under Article X.

107. A substantial proportion of Sida's financing of activities in the health sector relates to communicable diseases, including the fight against antimicrobial resistance (AMR). Support is given to programs to further development and application of scientific discoveries for the

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<sup>1</sup> <https://www.sida.se/en>.



prevention or handling of diseases. Examples of activities supported by Sida, chosen to illustrate part of the breadth of Sida's Article X-relevant activities, include:

(a) The Special Programme for Research and Training in Tropical Diseases (TDR): Sida supports TDR, hosted by the World Health Organization (WHO) and co-sponsored by the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the World Bank and WHO. TDR supports effective and innovative global health research, through strengthening the research capacity of affected countries and supports efforts to combat poverty-related infectious diseases. TDR also supports programs for development of systems for the detection, containment and prevention of vector borne-diseases and antimicrobial resistance. (USD 24.4 million as core contribution, plus USD 3.5 million earmarked for specific projects);

(b) European and Developing Countries Clinical Trials Partnership (EDCTP): Sida supports EDCTP, a partnership between EU member states and African countries for the training and improvement in the conduct of clinical trials for poverty-related infectious diseases. EDCTP builds capacity for the control of emerging and re-emerging infectious diseases, epidemic intelligence and capacity building for preparedness and outbreak response. (USD 10.8 million, plus USD 3.0 million for COVID-19 EDCTP);

(c) Consortium for Advanced research training in Africa (CARTA)/African Population and Health Research Center (APHRC): CARTA is a consortium of eight African universities, four research institutions, and nine Non-African partner institutions, jointly led by the African Population and Health Research Center (APHRC), Kenya, and the University of the Witwatersrand (Wits), South Africa, whose mission is to create and sustain African research-intensive universities in public and population health in Sub-Saharan Africa. Sweden has supported CARTA since 2012. (USD 9 million);

(d) International Vaccine Institute (IVI): IVI is an international, non-profit and multilateral, research organization involved in all areas of the vaccine spectrum, to facilitate sustainable introduction of vaccines in countries where they are most needed. The Swedish government together with the governments of the Republic of Korea, India and Finland, provides the core funding for IVI. Sweden has also allocated extra funds specifically aimed at strengthening IVI's COVID-19 related activities. For example, the project COVID-19 Research in African Settings (COVIA) aims to support local institutions in Madagascar and Burkina Faso to detect COVID-19 cases by implementing health care center-based disease surveillance. (USD 3.1 million, plus USD 2.9 million for COVID-19 IVI);

(e) Support to the Somali National Health Institute: The Swedish Public Health Agency (PHA), together with the World Health Organization (WHO) country office for Somalia, assists the Federal Ministry of Health Somalia by providing support in establishing the National Institute of Health (NIH) Somalia. In this, PHA also assists in the development of a framework for disease surveillance and reporting of laboratory data according to the UNICEF/WHO Integrated Disease Surveillance solution. In 2022 PHA helped finance the first ever Somali health research conference, held in Garowe, Puntland, Somalia. The conference was convened by the Somali Federal Ministry of Health and Human Services and National Institute of Health (NIH) and brought together 200 national and international researchers.<sup>2</sup> (approx. USD 4.4 million);

(f) Artificial Intelligence for Covid-19 (AI4COVID): The Global South AI4COVID Program, co-funded by Sida and Canada's International Development Research Centre (IDRC), supports multidisciplinary research focused on evidence-based artificial intelligence (AI) and data science approaches to aid COVID-19 response and recovery in low- and middle-income countries. (USD 3.4 million for 2020-2021, with a funding of USD 5.2 million from Sweden for the full period 2021-2024);

(g) CGIAR: CGIAR is a global partnership that unites organizations engaged in agricultural research. Its main activity is focused on increasing agricultural productivity in low-income countries. CGIAR works specifically with reducing poverty in rural areas,

<sup>2</sup> <https://ahpsr.who.int/newsroom/news/item/21-02-2022-somalia-makes-a-big-stride-in-health-research-by-hosting-the-first-ever-health-research-conference>.

increasing food safety, improving nutrition and health, and sustainable natural resource management. CGIARs research is conducted by 15 international centers that are members of the CGIAR System Organization, in close collaboration with 3000 partners including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. Sweden has been supporting CGIAR since 1971. (USD 81.5 million);

(h) BIOINNOVATE: BioInnovate Africa is a regional science and innovation-driven initiative, which supports scientists in several Eastern African countries to link biological based research ideas, inventions, and technologies to business and the market. BioInnovate Africa is implemented by the International Centre of Insect Physiology and Ecology (icipe) in Nairobi, Kenya. (USD 13.0 million);

(i) The International Center of Insect Physiology and Ecology, icipe: icipe, based in Nairobi, Kenya, is a research institute with an international focus, aiming to ensuring food security and improving the overall health status of peoples of the tropics by developing and extending management tools and strategies for harmful and useful arthropods. Sida is one of the core donors of icipe. (USD 13.3 million);

(j) International Training Programme (ITP), Healthy livestock – safe food: In this ongoing five-year capacity-developing programme, Swedish governmental authorities<sup>3</sup> partner with Burundi, Kenya, Rwanda, Tanzania, Uganda and Zambia to address how improved health in food producing animals impacts sustainable production of animal derived products. Participants engage in training, both in Sweden and in other partner countries, are offered mentor support and take part in regional seminars. (appr. USD 1.7 million for 2017-2021, and ongoing);

(k) In its most recent Strategy to Combat Antibiotic Resistance<sup>4</sup> the Swedish government highlights that antibiotic resistance is a global issue that concerns all, but that low-income countries are particularly at risk as limited access to clean water and sanitation, medicines and healthcare impacts morbidity and mortality rates for infectious diseases. In the food chain, antibiotic resistance is a threat to animal health and animal welfare, food safety, trade and economic development. Antibiotic resistance is an important issue for Sida and Swedish development cooperation, and some examples of Article X-relevant activities to counter antimicrobial resistance include:

- In 2019 UN created the Antimicrobial Resistance Multi-Partner Trust Fund (AMR MPTF). During 2021 Sweden donated approx. USD 1.2 million to AMR MPTF and for 2022-2024 Sida has provided an additional USD 7.6 million to the fund.
- The international research cooperation Joint Programming Initiative on Antimicrobial Resistance (JPIAMR) was launched in 2010 and today engages 29 nations and the European Commission. Sweden was one of the initiators of JPIAMR and is now represented by the Swedish Research Council (SRC) that also, with support from the European Commission (EC), hosts the JPIAMR Secretariat. Sida has partnered with the African Academy of Sciences and the African Populations Health and Research Center (APHRC) to co-fund participation of researchers from a number of African countries, with a total commitment from Sida of USD 7 million for 2019-2025.
- ReAct, Action on Antibiotic Resistance, is an independent global network dedicated to the problem of antibiotic resistance with a particular focus on low- and middle-income countries. Since ReAct's inception 2005, Sida has been ReAct's main funder (approx. USD 8.9 million 2017-2021).

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<sup>3</sup> The National Veterinary Institute, the Swedish Board of Agriculture, The National Food Agency and the Swedish University of Agricultural Sciences.

<sup>4</sup> [https://www.government.se/499178/globalassets/government/dokument/socialdepartementet/amr\\_strategi\\_eng\\_web.pdf](https://www.government.se/499178/globalassets/government/dokument/socialdepartementet/amr_strategi_eng_web.pdf)

## **B. Swedish Ministry for Foreign Affairs**

108. Swedish Article X-relevant international support is also channelled through the Swedish Ministry for Foreign Affairs (MFA), for, amongst other issues, global health assistance. Support is mainly provided to multilateral organisations and funds, including the Global Fund to Fight AIDS, Tuberculosis and Malaria, (approx. USD 495 million for 2017-2021), core support to UNAIDS (USD 167 million for 2017-2021) and core support to Gavi, the Vaccine Alliance, both through direct funding and through IFFIm (International Finance Facility for Immunisation) (approx. USD 196 million for 2017-2021).

109. Examples of COVID-19 related support from MFA include:

(a) Additional support to Gavi via COVAX Advance Market Commitment (AMC) and IFFIm with USD 34.2 million. This extra funding was earmarked to make COVID-19 vaccines available to lower-income countries.

(b) Core support in 2020 with approx. USD 10.9 million to The Global Fund to Fight AIDS, Tuberculosis and Malaria COVID-19 Response Mechanism (C19RM) that supports countries to mitigate the impact of COVID-19 on programs to fight HIV, TB and malaria and initiates urgent improvements in health and community systems.

(c) Support in 2020 with approx. USD 5.4 million to United Nations COVID-19 Response and Recovery Fund, a UN inter-agency fund mechanism established by the UN Secretary-General to help support low- and middle-income programme countries to respond to the pandemic and its impacts, including socio-economic effects.

(d) Project support to UNICEF for 1 million vaccine syringes to Rwanda (USD 95 000) in 2021.

## **C. Swedish Research Council**

110. Since 2013, responsibility for part of the support for Swedish development research has been transferred from Sida to the Swedish Research Council (SRC) and its Committee for Development Research. Development research within the SRC comprises support for research of relevance to the fight against poverty and for sustainable development, and support for collaboration and knowledge exchange between researchers in Sweden and researchers in low- and lower middle-income countries.

111. Funds for development research have mainly been made available through research project grants, or through network grants (Swedish Research Links) aimed to support the development of networks for long-term research partnerships between Swedish researchers and researchers from low- and lower middle-income countries. The long-term aim of the program is to contribute to mutual scientific and socioeconomic development of the countries involved. During the period 2017-2021 approximately USD 33 million was allocated from the Swedish Research Council to Article X-relevant international cooperation and collaboration research activities. Projects encompass a wide range of areas, including prevention, detection and handling of infectious diseases in humans, animals and plants, handling of plant pests, and the use of biotechnology applications in for example medicine and agriculture to help counter effects of global warming and to increase food security.

## **D. Examples of participation in international Article X-relevant activities by Swedish governmental agencies, universities and other academic institutes**

112. Personnel from a wide range of Swedish government agencies and academic institutions participate and contribute with expertise in international research and other cooperative activities, for example:

(a) Swedish government agencies has participated in several EU Joint Actions and other EU projects of relevance to Article X, including European Biodefence Laboratory Network (EBLN), EDA Test and Evaluation of Biological detection, identification and monitoring devices (EDA T&E BIODIM), EDA BFREE, EMERGE, SHARP, ERINGA, EvaG, EuroBioTox, and One Health European Joint Programme (OHEJP). In the EU-financed twinning project “Ensuring further progress of SPS and food safety system in Georgia” (2020-2022), led by Latvia with Sweden and Estonia as junior partners, the Swedish

Board of Agriculture (SBA) has contributed with expertise during the establishment of a Georgian salmonella control program in poultry. Likewise, in the EU-financed twinning project “Support to the National Food Safety Agency of the Republic of Moldova“, led by Lithuania with Latvia and Sweden as junior partners, personnel from the SBA contributed with expertise during the development of contingency plans for plant pests. In addition, in the EU-financed project Latohop (2019-2022) the Swedish Public Health Agency (PHA), SBA and the National Veterinary Institute (SVA) support Latvia in the implementation of their One Health National Action Plan against Antimicrobial Resistance.

(b) The Swedish Public Health Agency (PHA) has arranged a number of international courses and exercises, including:

- Biorisk Management Courses covering biosafety levels 2-4, as part of the EU project “Emerging Response to highly dangerous and emerging pathogens at the EU level” (EMERGE) (Solna, Sweden).
- Cross-sectoral biorisk awareness and mitigation training, on behalf of ECDC (Budapest, Hungary and Olhão, Portugal).
- Biosafety Level 4 Laboratory Training at the PHA, as part of a cooperation agreement between Korea CDC and PHA.
- Biorisk management workshop (Maputo, Mozambique).
- Training at National Public Health Reference Laboratory (Maputo, Mozambique).

(c) The PHA supports the expansion of the Global Antimicrobial Resistance Surveillance System through its WHO Collaborating Centre. The centre, among other issues, supports further development of national surveillance systems in countries in need of capacity building. An important task is to support implementation of the global surveillance system Global Antimicrobial Resistance and Use Surveillance System (GLASS).

(d) The National Veterinary Institute (SVA) during 2017-2021 participated in a number of international research projects, where focus mainly was on diseases in food producing animals, whereof some zoonoses. Projects were conducted in cooperation with researchers in Albania, Armenia, Bangladesh, Bulgaria, Dominican Republic, Georgia, Hong Kong, Kenya, Kosovo, North Macedonia, Romania, Russia, Rwanda, Senegal, Serbia, Tajikistan, Turkey, Uganda, and Vietnam. Other international cooperation projects focused on antibiotic resistance, climate change adaption and capacity building.

(e) Swedish universities frequently engage in research and educational activities in cooperation with academic institutes in other countries, often in the Global South. Examples include:

- At the Swedish University of Agricultural Sciences (SLU), international students from low- and middle-income countries participate in programmes as Animal Science and Plant Biology for Sustainable Production. Scientists from SLU participate in international networks and support international organisations such as CGIAR centres, FAO, EPPO and OIE.
- Uppsala University is engaged in many international collaborations. The Department of Medical Biochemistry and Microbiology (IMBIM) since 2009 holds a Master’s program covering the breath of infection biology. Students from all over the World learn about molecular pathogen-host interactions, diagnosis, therapy, evolution of resistance, surveillance and other aspects of infectious diseases in humans, animals and plants. IMBIM is also hosting the Zoonosis Science Centre (ZSC) that has on-going field projects monitoring pathogens, their vectors and hosts within Sweden and in several countries in Africa, Asia and South America, projects that include capacity-building, including supervision of local PhD students and post-docs.
- The Medical Faculty at Linköping University conducts research collaborations on tuberculosis in cooperation with researchers from South Africa, and on HIV together with researchers from Guinea-Bissau and Ethiopia.

- Sweden has assisted, via Umeå University, Somalia NIH in establishing The Somali Health Action Journal (SHAJ)<sup>5</sup>, an open-access online scientific journal that currently is hosted by Umeå University Library, Sweden.

(f) In 2019, the Swedish Defence and Research Agency (FOI) organized the 13<sup>th</sup> CBRNe Protection Symposium (previously named CBW Protection Symposium). The symposium has been arranged every third year since its start in 1983 and focuses on research developments within relevant areas. The purpose of the symposium is to create an interdisciplinary forum for the mutual exchange of information between researchers, industry and other stakeholders regarding protection against CBRNe agents. The symposium in 2019 gathered around 700 participants from 30 countries.

(g) Sweden has, via FOI, contributed to the strengthening of the UN Secretary Generals Mechanism, and thus to global capacity for investigating of alleged use of biological weapons (for details, please see the Swedish Compliance Report 2022).

(h) The Swedish Armed Forces has participated in international exercises as Reccex, and in NATO COMEDS Force Health Protection Working Group, NATO COMEDS Medical Intelligence, NATO COMEDS Food and Water Veterinary Panel and NATO COMEDS Force and Health Protection.

## Switzerland

113. In line with the requested background information for the Ninth Review Conference of the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, in particular the request for background information on the implementation of Article X as contained in document BWC/CONF.IX/PC/2, Switzerland submits the following report to States Parties:

114. Switzerland is fully committed to its obligations under Article X.

115. Switzerland supports initiatives aimed at enhancing cooperation across sectors in an international setting. In 2016, the Government of Switzerland assisted the Governments of Vietnam and Pakistan through WHO headquarters and the WHO country offices in the elaboration and establishment of national biosafety legislation.

116. Regarding the outbreak of Ebola in Western Africa between 2013 and 2016, Switzerland supported Doctors without Borders (MSF-Suisse) in its work to combat the Ebola epidemic in Guinea, Liberia and Sierra Leone. Furthermore, the Swiss Humanitarian Assistance financed various direct actions of the Government of Liberia and sent personnel to the region. Also Spiez Laboratory contributed on site to the fight against the Ebola virus in Western Africa through its active participation in the European Mobile Laboratory (EMLab) project which is linked to WHO's Global Outbreak Alert and Response Network (GOARN). Renewed on-site assistance by Spiez Laboratory in support of redressing the sanitary situation in Guinea during the renewed Ebola outbreak of 2021 was coordinated through GOARN and EMLab. To fulfil its tasks, Spiez Laboratory relied on its expertise in quality assurance of specialized laboratories for the analysis and diagnosis of highly pathogenic agents (EQADeBa, QUANDHIP, EMERGE, SHARP) and toxins (EQuATox, EuroBioTox). Spiez Laboratory also takes part in WHO quality assurance exercises for pathogens that are within its area of expertise.

117. In the early days of the Covid-19 pandemic, Spiez Laboratory together with the Swiss Tropical and Public Health Institute (Swiss TPH) established a reliable and quality assured diagnostic test in Equatorial Guinea before the first case of Covid-19 was confirmed in the country.

118. In 2021, Spiez Laboratory became the first facility of the WHO BioHub system, the purpose of which is 1) the timely sharing of biological materials with epidemic or pandemic potential (BMEPP); 2) to facilitate rapid access and analysis of BMEPP to enable risk assessment and development of effective and safe countermeasures including diagnostics,

<sup>5</sup> <https://journals.ub.umu.se/index.php/shaj>

vaccines and therapeutics; and 3) to ensure fair and equitable access to such products by all countries, based on public health needs. Furthermore, Spiez Laboratory is also a trusted laboratory of the International Committee of the Red Cross (ICRC).

119. Switzerland is an active member of the G7 Global Partnership against the Spread of Weapons and Materials of Mass Destruction. Swiss efforts particularly focus on the Biological Security Working Group and its Signature Initiative to Mitigate Deliberate Biological Threats in Africa.

120. Switzerland intends to further its efforts in the field of assistance, in particular in the areas of training and education as well as implementation support.

## **United Kingdom of Great Britain and Northern Ireland**

121. This paper provides an illustrative overview of the diverse range of programmes, projects and funding from UK public and private bodies that support the aims and objectives of Article X. The paper is designed to meet the requirement set out in the Seventh Review Conference Final Declaration (paragraph 61) on the submission of national reports, at least biannually, on the steps taken by States Parties to implement Article X. It follows a similar structure to previous UK Article X reports and provides an update on more recent UK initiatives.

### **I. Government Departments, Agencies and Funded Programmes**

#### **A. Antimicrobial Resistance (AMR)**

122. Global AMR Innovation Fund (GAMRIF) is a UK Aid fund that supports research and development around the world to reduce the threat of antimicrobial resistance in low and middle-income countries (LMIC)<sup>6</sup>. The fund supports early-stage innovative research in underfunded areas of AMR research and development and works with research organisations, governments and industry to:

- establish international research partnerships and support research that funds innovation and development of new technologies to tackle AMR;
- leverage investment from partners to support sustainable financing for AMR;
- establish partnerships using a ‘One Health’ approach;
- fund projects that will develop solutions specifically for LMICs.

123. The use of antimicrobials in livestock production is a primary contributor to the development and spread of AMR. Drug-resistant microbes can be transmitted from animals to humans via direct contact or through the food chain and the environment. This poses a potential significant threat to human health. This research will benefit LMICs, which are disproportionately impacted by AMR. The programme will be delivered on behalf of GAMRIF by the Biotechnology and Biological Sciences Research Council (BBSRC) and the Natural Environment Research Council (NERC) in the UK and by Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) in Argentina. Some examples of GAMRIF collaborations are listed below:

- A UK-China research competition to support innovations to address antimicrobial infections in both humans and animals<sup>7</sup>. These collaborative projects enabled novel research to be conducted that neither country could carry out alone. Fourteen projects were selected to run over three years and include a diverse range of innovations. Examples include novel diagnostics, therapeutics, and animal feed. The results of this research will have global implications including in China and across emerging and developing countries. Among these projects, are a collaboration between The Vaccine

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<sup>6</sup> <https://www.gov.uk/government/groups/the-global-amr-innovation-fund>

<sup>7</sup> <https://www.gov.uk/government/news/uk-china-partnerships-against-antimicrobial-resistance-get-funding>

Group, based in Plymouth, UK and the Shanghai Veterinary Research Institute (SHVRI), Chinese Academy of Agricultural Science (CAAS), which plans to use a bovine virus as a safe, inexpensive, single dose vaccine to control *Streptococcus suis* infection in domestic pigs.

- In October 2019 British and Argentinian researchers launched the ‘Tools to tackle AMR in the environment’ programme in Buenos Aires, an AMR research partnerships between UK and Argentina<sup>8</sup>. Partnerships include, University of Exeter and Nacional de Laboratorios e Institutos de Salud who have started to develop a conceptual framework to improve understanding of AMR in livestock systems for translation into policy and practice<sup>9</sup>.

124. The UK Government’s Global AMR Innovation Fund, managed by the Department of Health and Social Care (DHSC) and Canada’s International Development Research Centre (IDRC) are collaborating on a new initiative, aimed at reducing the emerging risk to global health and food security posed by antimicrobial resistance in animals<sup>10</sup>.

125. Innovative Veterinary Solutions for Antimicrobial Resistance (InnoVet-AMR) funds research to develop new animal vaccines and other alternative innovations to fight AMR in livestock and aquaculture production in low- and middle-income countries (LMICs). Through InnoVet-AMR, IDRC and DHSC aim to achieve two main objectives:

- Support research that will identify innovative veterinary solutions, including vaccines and alternative solutions, to reduce the use of antimicrobials in livestock and aquaculture operations in LMICs;
- Build effective partnerships to coordinate discovery, development and sustainable delivery of affordable innovative veterinary solutions to reduce the use of antimicrobials in livestock and aquaculture operations in LMICs.

## B. Fleming fund

126. The Fleming Fund is a UK aid programme supporting up to 25 countries across Africa and Asia to tackle antimicrobial resistance<sup>11</sup>. The Fund is managed by the Department of Health and Social Care and invests in strengthening surveillance systems through a portfolio of country and regional grants, global projects and fellowship schemes. The UK Government established the programme in 2015 in response to the UK AMR Review and the WHO Global Action Plan on AMR, which called for funding to improve AMR surveillance, public awareness and responsible drug use. The programme focuses on LMIC because they are expected to bear the heaviest consequences of the spread of AMR. The UK AMR Review estimated that by 2050, up to 90% of all deaths related to AMR would come from Africa and Asia.

127. In 2019 funding for projects to help tackle the threat of AMR and help scientists achieve global universal health coverage was announced by the UK Chief Medical Officer at the UN General Assembly. More than £6 million will be invested to strengthen existing surveillance systems tracking AMR trends across Africa and Asia, while a further £12 million was announced to improve collaborations on health systems research between low and middle income countries, for example in sub-Saharan Africa, and the UK<sup>12</sup>. Some examples of Fleming Fund projects include:

- In May 2022 in Seoul, the International Vaccine Institute (IVI), Ministry of Health and Family Welfare (MOHFW) of Bangladesh shared key findings from the Capturing data on Antimicrobial resistance Patterns and Trends in Use in Regions of

<sup>8</sup> <https://www.gov.uk/government/news/5-million-given-to-amr-research-partnerships-between-uk-and-argentina>

<sup>9</sup> <https://gtr.ukri.org/projects?ref=BB%2FT004452%2F1>

<sup>10</sup> <https://healthmedia.blog.gov.uk/2018/04/12/dhsc-joins-global-fight-to-tackle-antimicrobial-resistance-in-animals/>

<sup>11</sup> <https://www.flemingfund.org/>

<sup>12</sup> <https://www.flemingfund.org/publications/uk-to-invest-in-new-research-to-tackle-evolving-health-threats-across-the-globe/>

Asia (CAPTURA) project<sup>Error! Bookmark not defined.</sup>. CAPTURA is an IVI-led initiative to increase the volume and quality of data on antimicrobial resistance (AMR), consumption (AMC), and use (AMU) in South and Southeast Asia. The research findings will help the government of Bangladesh form evidence-based policies and practices to contain AMR, which is a critical and growing threat to global public health.

- In June 2022, the UK's Fleming Fund refurbished the microbiology laboratory at the Islamabad National Institute of Health (NIH) as part of the joint effort to enhance Pakistan's capacity to manage and mitigate the threat of AMR<sup>Error! Bookmark not defined.</sup>. The refurbishment includes ten new laboratories and seven offices, as well as new equipment, training and technical assistance. This is one of two labs, along with the National Reference Laboratory for Poultry Diseases, which has recently been upgraded to effectively carry out AMR surveillance. The Fleming Fund country grant represents one part of a longstanding bilateral health partnership with Pakistan. The Fund also supports five regional grants and a professional fellowship scheme, while funding the South Centre's research to tackle AMR and coordinate activities between countries. Together, these are helping to manage and mitigate the threat of AMR in Pakistan, contributing towards a healthier world.
- In March 2021, the UK and Vietnam signed a new Memorandum of Understanding further strengthening a partnership between the two countries to tackle antimicrobial resistance (AMR). The agreement supports the existing work of UK aid's Fleming Fund in Vietnam, a programme aimed at equipping laboratories and strengthening AMR surveillance systems in LMIC. The Fleming Fund has been working in Vietnam since 2015 but invested nearly £9 million in the country in 2019 to improve One Health information sharing and support a joint One Health surveillance system. This activity will complement Vietnam's existing One Health Strategy which focuses on long-term capacity building, preparedness and prevention across human health, animal health and the environment. Reducing the threat of drug resistance in Vietnam is critical, as research suggests the country has one of the highest rates of antimicrobial drug use in Asia.
- The UK and Sierra Leone launched a £1.5m partnership to tackle drug resistance<sup>13</sup>. The partnership aims to tackle drug resistance by improving public health surveillance systems, upgrading laboratory equipment and training scientists. In Sierra Leone, the Fleming Fund has appointed the World Health Organization (WHO) to support the country to develop AMR surveillance. The WHO will also be responsible for improving laboratory diagnostics, establishing AMR technical working groups within the national government and building capacity of scientists and laboratory staff.
- The UK and Nigeria launched a £10m partnership to tackle drug resistance through improving public health surveillance systems, upgrading laboratory equipment, and training technicians and scientists<sup>14</sup>. In Nigeria, the Fleming Fund has appointed DAI to support Nigeria's surveillance system, in partnership with the Nigerian AMR coordination committee and other key partners. Investments and activities in Nigeria to date include the appointment of ten professional fellows who are receiving training on specific skills including data management, microbiology, epidemiology and biosafety to help tackle AMR as well as investment in 18 laboratories across the country.
- Uganda has received three pioneering laboratory machines that can cut bacteriology diagnostics time in half as part of a UK/Uganda partnership aimed at tackling drug resistance<sup>15</sup>. The machines automate part of the laboratory tests that identify the bacteria causing a patient's infection and can deliver results to doctors up to 18 hours

<sup>13</sup> <https://www.flemingfund.org/publications/uk-and-sierra-leone-launch-1-5m-partnership-to-tackle-growing-threat-of-drug-resistance/>

<sup>14</sup> <https://www.flemingfund.org/publications/uk-and-nigeria-launch-10m-partnership-to-tackle-growing-threat-of-drug-resistance/>

<sup>15</sup> <https://www.flemingfund.org/publications/uganda-receives-medical-equipment-that-can-cut-bacteriology-diagnostics-time-in-half/>



quicker, saving critical time in the diagnosis of life-threatening conditions. One of the machines, a mass spectrometer MALDI-TOF, is the first of its kind in Uganda and can identify bacteria in just two minutes, compared with 18-48 hours for conventional testing. The machines have been provided as a part of the Fleming Fund and the programme is managed by the UK Department of Health and Social Care. The Infectious Disease Institute (IDI), the Fleming Fund's implementing partner in Uganda, is helping to facilitate the training, in collaboration with medical equipment supplier BD. IDI is also supporting the development of a national AMR surveillance strategy, a One Health national governance structure and equipment delivery in animal health laboratories.

- In 2020, The Fleming Fund awarded two new grants in partnership with the governments of Zimbabwe and Malawi to tackle growing threat of drug resistance<sup>16</sup>. The grants support public and animal health surveillance systems, improve laboratory infrastructure and train technicians and scientists. These initiatives will improve how we understand drug resistance and drugs usage around the world, which will support the fundamental changes that are needed to the way antibiotics are consumed and manufactured to mitigate this growing threat.

128. The Fleming Fund programme has played a significant role in the COVID-19 pandemic response<sup>17</sup>. The COVID-19 pandemic continues to put health systems and economies under pressure across the globe. Despite the many challenges to the response, support from the Fleming Fund is helping governments respond more quickly and efficiently to the pandemic. Some country programmes have taken a flexible approach to activities to address the evolving needs, such as repurposing biosafety equipment or supporting specific training. Additionally, the programme's inherent design and funding of activities have contributed to national pandemic responses. Funding recipients and governments have renovated and enhanced laboratories, trained staff and supported cross-governmental collaboration. Some examples of Fleming fund activities related to the COVID-19 pandemic include:

- In Zambia, laboratory buildings were in disrepair with limited safety or testing equipment prior to support from the Fleming Fund. However, investments through a Country Grant have supported building renovations and equipment procurement, allowing the country to leverage its public laboratories much more effectively in the pandemic. In Timor-Leste, grantees highlighted that their team provided immediate COVID-19 support to government stakeholders as a result of ongoing relationships and activities from the Fund. Strengthening the National Health Laboratory, provided vital support to the Ministry of Health in their efforts to protect the Timorese people.
- In Uganda, the Infectious Disease Institute highlighted that their training on biosafety, sample management and collection was hugely valuable to the COVID-19 response.
- The COVID-19 pandemic has encouraged government investment in laboratory strengthening in Papua New Guinea. Major gaps in tracking coronavirus through the laboratory referral system were hampering the response. The National Department of Health and the WHO highlighted an urgent need to install a laboratory information system (LIMS) capable of filling these gaps. The Fleming Fund helped identify and fast-track installation of the LIMS in all public laboratories nationwide.

129. Although all countries' health services are strained, the Fleming Fund's focus on laboratory strengthening, capacity building and surveillance has furthered the pandemic response. In Pakistan, regional authorities have become more aware of the need for coordinated national surveillance and are now working to incorporate the private sector in surveillance activities. Government responses in Papua New Guinea, Pakistan and Bhutan suggest that in future, COVID-19 may act as a catalyst for continued action on AMR and help governments recognise the importance of surveillance.

<sup>16</sup> <https://www.flemingfund.org/publications/fleming-fund-to-tackle-growing-threat-of-drug-resistance-in-malawi-and-zimbabwe/>

<sup>17</sup> <https://www.flemingfund.org/publications/fleming-fund-programme-aids-covid-19-response/>

130. The Fleming fund has contributed significantly to improving genomics capabilities to aid the response to the COVID-19 pandemic. As cases of COVID-19 surged across the globe, businesses, innovators and academics were looking for new ways to combat the virus through science and technology<sup>18</sup>. Since 2019, the Fleming Fund has partnered with sequencing facilities in Denmark, Nigeria, Tanzania and South Africa to build technical genomics and AMR surveillance capacity in Africa. Scientists in South Africa are now using support from the Fleming Fund to sequence samples of COVID-19. As part of the response, the Fleming Fund is supporting the sequencing of additional COVID-19 isolates in South Africa and other Sub-Saharan countries. Sequencing is particularly useful to monitor the diseases' mutations and track outbreaks and has helped identify gaps in infection prevention within hospitals and identify clusters of the disease.

131. In June 2020, the UK and Indonesia signed a Memorandum of Understanding on Health Cooperation on Antimicrobial Resistance Surveillance<sup>19</sup>. The two countries have also signed a Grant Agreement for the Fleming Fund partnership on antimicrobial resistance (AMR) surveillance in Indonesia. The agreement between the UK Department of Health and Social Care (DHSC) and The Ministry of Health of the Republic of Indonesia (MoH) establishes a cooperation framework between the UK and Indonesia to share knowledge and expertise on the development of the health sector in both countries. The MoU focuses on areas of cooperation such as healthcare services, disease prevention and control, health technology and medical devices, human resources for health development, and health research and development. Agreed activities for collaboration under this MoU include digital health services and community-based telemedicine cooperation, plus information sharing on infectious diseases in hospitals (such as COVID-19). The Ministry of Health of the Republic of Indonesia will work together across all ministerial stakeholders, such as the Ministry of Agriculture, the Ministry of Maritime Affairs and Fisheries, the Ministry of Environment, Forest, and Climate Change, the Indonesia Food and Drug Administration, and the National Antimicrobial Resistance Control Committee, to implement all the project activities agreed in the work plan of the Fleming Fund programme on AMR.

### C. Vaccines and Official Development Assistance

132. Official development assistance (ODA) funding, provided by the Department of Health and Social Care's (DHSC) UK Vaccines network (UKVN), and delivered by Innovate UK, has been awarded to 22 research projects. The projects will support development of vaccines for diseases that have the potential to become epidemics. This includes: Ebola, Lassa Fever, Zika, Crimean-Congo Haemorrhagic Fever, Chikungunya virus. Some of the projects are also looking at ways to tackle 'Disease X', a hypothetical future pathogen, to ensure the world is equipped for future epidemics or pandemics.

133. The UKVN has already funded 78 projects with over £115 million worth of UK aid funding, as part of the UK government's commitment to defeat poverty, tackle instability and create prosperity in developing countries. For example, earlier work on a Middle Eastern Respiratory Syndrome vaccine by the University of Oxford allowed them to develop the Oxford AstraZeneca COVID-19 vaccine more quickly. The vaccine has since protected tens of millions of people across the world. The project was funded in part by the UKVN.

134. Protecting against COVID-19 and future diseases: The UK is committed to supporting the rest of the world in protecting people from COVID-19 and future diseases. The UK has invested more than £88 million to support the development of the Oxford AstraZeneca vaccine and, to date, has donated 32.2 million COVID-19 vaccine doses. 26.7 million doses have gone to COVAX, a global scheme to get vaccines to developing countries. This builds on the £1.3 billion in UK aid committed to the international health response early in the pandemic, supporting vaccines, health systems and economic recovery in developing countries.

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<sup>18</sup> <https://www.flemingfund.org/publications/genomics-the-fleming-fund-and-covid-19/>

<sup>19</sup> <https://www.flemingfund.org/publications/the-uk-and-indonesia-announces-mou-on-health-cooperation-and-a-grant-agreement-on-antimicrobial-resistance-surveillance/>

135. In February 2022, the UK pledged £160 million to Coalition for Epidemic Preparedness Innovations (CEPI) to speed up vaccine development<sup>20</sup>. COVID-19 has shown vaccines are the way out of pandemics, saving millions of lives and restoring cherished freedoms. The funding announced by the UK will support CEPI's drive to accelerate the development of vaccines for the deadliest infectious diseases, like COVID-19, and enable equitable access to these vaccines globally. This announcement came ahead of the UK government hosting the Global Pandemic Preparedness Summit in March 2022 in London. The event raised funds for CEPI's goal and was backed by the UK during the UK's G7 presidency in 2021, to cut the time it takes to develop new vaccines to 100 days, including 'variant-proof' vaccines that will work against multiple future COVID-19 variants.

136. In 2021, AstraZeneca advanced its global rollout of COVID-19 vaccine through COVAX<sup>21</sup>. COVAX is a global mechanism co-founded by CEPI and Gavi, the Vaccine Alliance working with WHO, UNICEF, civil society organisations and industry groups to accelerate the development, production and equitable access to new COVID-19 tools across the world for all participating countries, regardless of income level. In 2021, the first of many millions of doses of AstraZeneca's COVID-19 vaccine, Vaxzevria, started arriving in LMIC across the world through the multilateral COVAX initiative, the first steps in fulfilling the Company's efforts to provide broad and equitable access to the vaccine. In February 2022, the UK pledged £160 million to boost global vaccine development<sup>22</sup>. Some examples of global rollout of Vaxzevria include:

- More than 15 million doses were delivered to Thailand's Ministry of Public Health in December 2021, to complete an initial commitment of 61 million. Another 60 million doses will be supplied to Thailand across 2022, based on an agreement made between AstraZeneca and the Thai government in September 2021.
- AstraZeneca delivers its largest shipment of over two million COVID-19 vaccine doses to Malaysia<sup>23</sup>. In January 2022 a further 2,017,500 doses of Vaxzevria were delivered to Malaysia in support of the country's booster vaccination programme. This is in addition to 324,000 doses delivered previously, bringing January's total supply to over 2.3 million doses.

137. AstraZeneca are working with partner countries to bridge the vaccine gap threatening Africa<sup>24</sup>. AstraZeneca were the first vaccine manufacturer to commit to COVAX, supplying more than 90% of the vaccine to more than 127 participating countries, including 38 African countries at the end of June 2021. Countries such as Ghana, Côte d'Ivoire, Kenya, Rwanda and Ethiopia have all participated in this approach. Developing, producing and supplying a vaccine for the world is an extraordinarily complicated challenge and we have all learned many lessons on the way. These are lessons that should not merely be carried into future pandemic preparedness, they must be addressed right now. Entire communities and economies are depending on it. In 2021, just over 1% of people in Africa had been fully vaccinated. There is still a long way to go but this approach could bring much-needed relief to the world's most vulnerable communities. This will only be possible if we work together, apply our lessons learned and do what is necessary to vaccinate the whole world, not just portions of it.

<sup>20</sup> <https://www.gov.uk/government/news/uk-pledges-160-million-to-boost-global-vaccine-development#:~:text=The%20UK%20will%20pledge%20%C2%A3,and%20support%20this%20vital%20work>.

<sup>21</sup> <https://www.astrazeneca.com/media-centre/press-releases/2021/astrazeneca-advances-mass-global-rollout-of-covid-19-vaccine-through-covax.html>

<sup>22</sup> <https://www.gov.uk/government/news/uk-pledges-160-million-to-boost-global-vaccine-development#:~:text=The%20UK%20will%20pledge%20%C2%A3,and%20support%20this%20vital%20work>

<sup>23</sup> <https://www.astrazeneca.com/country-sites/malaysia/press-releases/astrazeneca-delivers-its-largest-shipment-of-over-two-million-covid-19-vaccine-doses-to-malaysia.html>

<sup>24</sup> <https://www.astrazeneca.com/media-centre/articles/2021/bridging-the-vaccine-gap-threatening-africa.html>

138. The UK are collaborating with the Institut Pasteur, Madagascar researching vaccination approaches to break plague transmission in Madagascar<sup>25</sup>. Although an ancient disease, plague is still an unwelcome presence in certain regions of the world, where it exists in animal reservoirs and outbreaks form time to time<sup>26</sup>. The most serious outbreak of plague in modern times occurred in Madagascar in 2018, with more than 2600 cases and an estimated case fatality rate of 8.9%<sup>27</sup>. In Madagascar as well as in other parts of the world, plague causes seasonal outbreaks, with risk of epidemic potential and transmission to new regions. These seasonal outbreaks are caused by flea-vector transmission from wildlife reservoirs (principally rats). There is no approved vaccine for plague and antibiotic therapy needs to be given early after exposure to infection to be fully effective. In a collaboration between UK's MHRA, Defence Science and Technology Laboratory (Dstl), University of Strathclyde and the Institut Pasteur Madagascar, a sub-unit vaccine in a novel formulation was tested against a Malagasy strain of the causative bacterium, *Yersinia pestis*. This sub-unit vaccine had already been shown to be efficacious in animal models of infection and was also shown to be safe and immunogenic in a Phase 1 clinical trial<sup>28</sup>. In this recent study, the vaccine was reformulated for distribution to a LMIC, as a stable, dry powder. The vaccine was then tested under laboratory conditions at the Institute Pasteur in Madagascar and was found to induce immunity in rats, and therefore showed promise for preventing transmission to humans. Production of a plague vaccine will also mitigate development of AMR resistant strains of plague.

139. ODA is funding provided by official agencies around the world, including the UK government, to promote the economic development and welfare of developing countries. The Newton Fund and Global Challenges Research Fund are managed by the UK's Department for Business, Energy and Industrial Strategy (BEIS). The funds are delivered through UK partners who offer tailored research and innovation programmes in collaboration with governments and organisations in each partner country.

140. The Newton Fund builds research and innovation partnerships with countries in Africa, Asia and Latin America to support economic development and social welfare, tackle global challenges and develop talent and careers<sup>29</sup>. Partner countries include: Colombia, Egypt, India, Malaysia, Jordan, Kenya, Peru, Philippines, Türkiye, Vietnam. The Newton Fund does this through:

- Equitable partnerships with middle-income countries;
- Multidisciplinary research based on agreed national strategies;
- Nurturing talent and careers with capacity development.

141. The Global Challenges Research Fund (GCRF) supports UK and international researchers and innovators to take on key issues affecting developing countries through:

- Challenge-led multidisciplinary research;
- Strengthening capability for research, innovation and knowledge exchange;
- Providing an agile response to emergencies.

#### D. Disaster Response

142. The UK Public Health Rapid Support Team (UK-PHRST) was created after the Ebola outbreak in West Africa in 2014-16 to support LMICs to prepare for and respond to public

<sup>25</sup> <https://www.birmingham.ac.uk/research/immunology-immunotherapy/research/bactivac/funded-projects/pump-priming-round-3/dr-barry-moore.aspx>

<sup>26</sup> Voahangy *et al.*, Potential human immunotherapeutics for plague, *Immunotherapy Advances*, Volume 1, Issue 1, January 2021, Itab020, <https://doi.org/10.1093/immadv/Itab020>

<sup>27</sup> Plague outbreak in Madagascar; external situation report 14, 4 Dec 2017, WHOafro.who.int/health-topics/plague/plague-outbreak-situation-reports.

<sup>28</sup> Williamson ED *et al.*, Human immune response to a plague vaccine comprising recombinant F1 and V antigens. *Infect Immun.* 2005 Jun;73(6):3598-608. doi: 10.1128/IAI.73.6.3598-3608.2005. PMID: 15908389; PMCID: PMC1111881.

<sup>29</sup> <https://www.newton-gcrf.org/newton-fund/>

health outbreaks<sup>30</sup>. In the six years of operation of the UK-PHRST, the team has led 23 deployments in response to disease outbreaks and over 40 research projects. The onset of the COVID-19 pandemic radically changed the world we live in and brought outbreak preparedness to the forefront of public health and public consciousness. COVID-19 has challenged the world and the UK-PHRST. However, UK-PHRST has adapted quickly to ensure the team continues to provide multidisciplinary support, in-person and remote, to aid many nations such as;

- Providing infection prevention, control programmes and sero-surveillance guidance at Africa CDC;
- Multidisciplinary support to the Rohingya camps in Bangladesh;
- Supporting the Partnership for Evidence-based Response to COVID-19 across continents;
- Running a Multiple Open Online Course in COVID-19 at the beginning of the pandemic;
- Supporting SARS-CoV-2 diagnostics inside labs.

143. UK-PHRST research and projects have flexed to the needs and concerns of LMICs and the unique challenges COVID-19 has presented to these nations. The team has carried out rapid research to address knowledge gaps when studying outbreaks, including questions about the barriers to vaccine rollouts and the importance of addressing mental health and psychosocial support during outbreaks. The team have continued to develop and strengthen partnerships so the team can act when and where required. Working with the UK government, the World Health Organization (WHO) and the Global Outbreak Alert and Response Network (GOARN), UK-PHRST has created a global network that shapes policy and frames the outbreak responses of the future. The partnerships within LMICs are the most critical, tackling disease at the frontline and enabling progress in preparing for the next epidemic and working together to ask key questions to allow us to respond better in the future.

## **E. Pandemic Preparedness**

144. In June 2022, the UK announced support for a new international drive to prevent and prepare for future pandemics<sup>31</sup>. The UK will give £25 million to found a new World Bank fund to prevent, prepare for and respond to future devastating pandemics. The investment aims to prevent future pandemics and stop the devastating human and economic impact of COVID-19 from happening again. The ‘Financial Intermediary Fund’ for pandemic prevention, preparedness and response will provide funding to countries whose healthcare systems are dangerously unprepared for the challenges caused by large outbreaks of infectious diseases. It will ensure they can quickly respond to, and as far as possible contain, outbreaks before they spread across borders. The COVID-19 pandemic has led to at least 6.2 million deaths across the world and caused far-reaching economic devastation. Stopping a pandemic like this ever happening again will require a concerted and coordinated international effort. The new fund will help fill some of the financing gaps exposed by COVID-19, particularly insufficient financing for preparedness in national health systems and disease surveillance at country, regional and global levels. Crucially, the fund can help catalyse countries’ own financing, so the world is as equipped as possible whenever and wherever a new public health risk emerges.

<sup>30</sup> <https://ukhsa.blog.gov.uk/2021/12/03/five-years-of-the-uk-public-health-rapid-support-team/>

<sup>31</sup> <https://www.gov.uk/government/news/uk-supports-new-international-drive-to-prevent-and-prepare-for-future-pandemics>



## II. Academic and Research Councils

### A. UK Research and Innovation (UKRI)

145. In February 2022, UKRI announced a £10 million to combat potential epidemics in developing countries<sup>32</sup> comprising of 22 research projects which were selected by the government's UK Vaccine Network (UKVN) and will help tackle viruses such as Ebola, Lassa Fever and Zika. The projects will conduct research into vaccines and innovative new vaccine platforms to tackle some of the world's deadliest diseases in LMIC.

### B. Biotechnology and Biological Sciences Research Council (BBSRC)

146. BBSRC launched the Global coronavirus research and innovation network in September 2021 to bring together researchers from animal and human coronavirus communities<sup>33</sup>. The network was funded by the BBSRC and the UK's Department of Environment, Food and Rural Affairs (Defra). The network is to enhance our knowledge of this important virus family to inform preparedness and response strategies for future outbreaks. The UK International Coronavirus Network (UK-ICN) will provide and support global coordination for the delivery of collaborative scientific research and a sustained long-term One Health approach. This will enhance investigation and understanding of coronaviruses. The COVID-19 pandemic has stressed the urgency to advance the knowledge and understanding of the biology of coronaviruses that infect both animals and humans, embracing the need for a One Health approach.

147. The network is a joint partnership between: University of Liverpool, Animal and Plant Health Agency, The Roslin Institute, University of Edinburgh, The Pirbright Institute, University of Cambridge and it will bring together researchers and partners from all over the world, including: China, India, North America, Europe, Southeast Asia, Africa. The network will draw on major global research and industry players, who are working on veterinary and human coronaviruses, and will facilitate research collaborations to further the understanding of coronaviruses in the fields of virology, pathogenesis, genotypic markers of phenotype, transmission and immunity. According to current global and UK funding data, there is a major gap in understanding the transmission of coronaviruses from animals to humans and between animal species. To bridge this gap, the network will bring together experts to analyse gaps and identify research priorities to better understand interactions amongst animals, humans and the environment in order to prevent future outbreaks of zoonotic diseases. Embracing the One Health approach, the UK-ICN will draw on a range of expertise from different sectors, such as public health, animal health, and the environment. This is to comparatively assess animal and human coronavirus biology and streamline data integration of animal and human coronaviruses to further the understanding of pathogen biology to include, for example, seasonality, transmission, ecology and evolution, host response, effective intervention strategies. The decades of research on diagnostics and vaccines to animal coronaviruses has lots to teach in terms of dealing with severe coronavirus pandemics both in the present day and preparing for Disease X in the future.

### C. Neglected Tropical Diseases

148. In March 2021, UK scientists informed a roadmap to eliminate disease of poverty<sup>34</sup>. The World Health Organization is advocating a One Health approach to tackle parasitic blood flukes in Africa following successful UKRI-funded research. This renews hope that a major disease of poverty can be eliminated by 2030. The new strategy has been informed by the findings of UKRI-funded multidisciplinary research which shows how the parasitic flukes causing schistosomiasis to transmit between animals and people in Africa.

149. UK-West Africa collaboration. Schistosomiasis is a major neglected tropical disease (NTD) of both people and animals, with over 220 million people and untold millions of livestock infected worldwide. While over 200,000 people die from schistosomiasis each year,

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<sup>32</sup> <https://www.ukri.org/news/10-million-to-combat-potential-epidemics-in-developing-countries/>

<sup>33</sup> <https://www.ukri.org/news/global-coronavirus-research-and-innovation-network-launched/>

<sup>34</sup> <https://www.ukri.org/news/uk-scientists-inform-roadmap-to-eliminate-disease-of-poverty/>

its major effects are disabling. In children it causes, among other things, anaemia and stunting. The disease also has profound economic and wellbeing impacts for poor livestock-keeping communities. In Africa, despite almost 20 years of mass administration of an anti-parasite medication targeting, predominantly, school-aged children, schistosomiasis remains extremely high in some regions. The research was led by a team at the Royal Veterinary College (RVC) in partnership with teams from Senegal and Niger in West Africa and was jointly funded by UKRI, Foreign Commonwealth and Development Office and Dstl under the Zoonoses and Emerging Livestock Systems (BBSRC) programme. Scientists combined parasitological, epidemiological, molecular, clinical and environmental data to determine the occurrence and distribution of the different fluke species that lead to disease. Findings showed the widespread nature of the disease. Up to 88% of children and adults were infected with the flukes in the study areas and up to 94% of livestock. More than half of the wildlife sampled by the team were also infected. The research results highlighted the need for all potential host species of the parasite to be included in future schistosomiasis control efforts within Africa and beyond. They have informed the new WHO NTD 2021 to 2030 roadmap and the WHO control and elimination of schistosomiasis guidelines. These stress that an approach involving both animal health and human health experts must inform interventions to achieve disease elimination.

### III. Industry

150. In June 2022, GlaxoSmithKline (GSK) announced an investment of £1 billion over ten years to accelerate research and development (R&D) dedicated to infectious diseases that disproportionately affect LMICs<sup>35</sup>. This research will focus on new and disruptive vaccines and medicines to prevent and treat malaria, tuberculosis, HIV, neglected tropical diseases and AMR, which continue to have a devastating toll on the most vulnerable, accounting for more than 60% of the disease burden in many LMICs. Specifically, the investment will support:

- Delivery of next-generation vaccines and medicines for malaria and tuberculosis, offering shorter, simpler, safer treatment options for patients, including R&D on long-acting injectable countermeasures to protect against *P. falciparum* malaria;
- Work in partnership towards the goal of ending HIV/AIDS by developing and enabling access to innovative treatment and prevention options for people affected by HIV;
- Reduce antibiotic resistance by advancing our industry-leading pipeline for vaccines, including first-in-class vaccines against invasive non-typhoidal salmonellosis and shigellosis;
- Catalyse external funding for R&D for high-burden infectious diseases through multi-sectoral collaborations and alliances.

151. Over the next decade, this work will build on the long-term commitment and investment made by GSK in global health innovation. To date, this has delivered significant new interventions, including the first-ever malaria vaccine (and first-ever human vaccine against a parasite), the first radical cure of vivax malaria, as well as a promising tuberculosis vaccine candidate. These investments in global health form part of GSK's ambition to positively affect the lives of more than 2.5 billion people over the next ten years.

<sup>35</sup> <https://www.gsk.com/en-gb/media/press-releases/gsk-announces-1-billion-rd-investment-over-ten-years-to-get-ahead-of-infectious-diseases-in-lower-income-countries/>

## United States of America

### I. Background

152. The United States is firmly committed to fulfilling all of its obligations under the Biological and Toxin Weapons Convention (BWC), including those under Article X. The United States places great importance on Article X implementation and continues to invest significant resources in these efforts. The Seventh Review Conference confirmed the importance of implementation of Article X and requested States Parties to report on their fulfillment of their Article X obligations, in order to produce a more complete picture of its implementation.

153. The United States has worked collaboratively with the international community to pursue shared goals related to Article X, including, inter alia:

- Contributing to the advancement of life sciences for peaceful purposes;
  - Building sound, appropriate regulatory and oversight systems at all levels to ensure the safe and peaceful application of dual-use materials and technologies;
  - Effectively implementing our obligations under the BWC and United Nations Security Council Resolution (UNSCR) 1540;
  - Advancing educational and collaborative opportunities for the international scientific community; and
  - Improving global health security through preventing, detecting, and responding effectively to infectious disease, whether naturally occurring, deliberate, or accidental.
- Introduction.

### II. General perspectives on the implementation of Article X

154. The United States places great importance on the effective implementation of Article X of the Biological Weapons Convention (BWC) and invests billions of dollars in international cooperation and assistance programs. U.S. efforts aim to strengthen global health capacities to counter biological threats of all types – whether natural, accidental, or deliberate in origin – that could affect human, animal, or plant health.

155. Since our last report in 2020, the United States Government has committed over \$2.4 billion in international health, humanitarian, and economic assistance specifically aimed at fighting the pandemic and is deploying the full range of U.S. resources to contain and prevent the spread of COVID-19 across the globe.<sup>36</sup>

156. As the largest funder and implementer of global health programs worldwide, the United States Government engages in a wide range of cooperation and capacity-building assistance relevant to Article X. These efforts save lives by enhancing public health education; bolstering healthcare facilities; and building laboratory, disease-surveillance, and rapid-response capabilities in over 120 countries.

157. Additionally, the United States is by far the largest and most reliable contributor to crisis response and humanitarian action through WHO, UNICEF, the World Food Program, and dozens of other international organizations. Our support enables these organizations to fight disease and ultimately, protect lives. The United States is also one of the largest funders of basic and applied research in the life sciences. U.S. funding supports such work not only in the United States but around the world.

158. Official assistance programs and bilateral engagements comprise only a portion of a much larger array of assistance and cooperation provided by the United States. U.S. activities and programs to promote relevant international exchanges, cooperation, and support are

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<sup>36</sup> “Foreign Assistance for Coronavirus (COVID-19),” United States Department of State, <https://www.state.gov/foreign-assistance-for-coronavirus-covid-19/>.



undertaken not only by the federal government, but also by state and local governments, individuals, industry, foundations, academia, and other non-governmental organizations. Accordingly, most U.S. programs and related efforts that strengthen global health or promote international exchange and advances in the life sciences for peaceful purposes do not take place solely, or even primarily, specifically under the auspices of the BWC.

159. The breadth and scope of U.S. cooperation and assistance precludes a comprehensive listing of every program. Instead, this interim report provides examples to illustrate the range and diversity of activities that demonstrate the full commitment of the United States to Article X.

160. The remainder of the report addresses the U.S. response to COVID-19 and then is organized around the three basic obligations contained in Article X:

- To facilitate the fullest possible exchange of information, equipment, and materials for peaceful purposes.
- To cooperate in the further development and application of the life sciences for prevention of disease and other peaceful purposes.
- To implement the BWC in ways designed to avoid hampering the economic and technological development of States Parties or international co-operation in the field of peaceful bacteriological (biological) activities.

### **III. Response to the Covid-19 Pandemic**

161. Our experience combatting a pandemic for the last several years has amply illustrated the need to limit vulnerability to infectious diseases, including through bolstering health care infrastructure, strengthening diagnostic capabilities, and developing new vaccines, therapeutics, and diagnostics that are essential to outbreak response. Assisting States Parties in strengthening their national capacities to prevent, detect, and respond to infectious disease outbreaks is a direct contribution to the objectives and purposes of the BWC and is an important element of how the United States implements its obligations under Article X of the Convention.

162. The United States Government continues to take decisive action to build global health security capacity to respond to this and future outbreaks. We are deploying the full range of our capabilities to respond to COVID-19 and prevent future outbreaks around the globe from becoming pandemics. This effort builds upon decades of U.S. international life-saving health and humanitarian assistance. The United States and its international partners together donated COVID-19 vaccines to the world to end the pandemic. In partnership with COVID-19 Vaccines Global Access (COVAX), and through bilateral agreements, the U.S. has provided more than 610 million doses of the COVID-19 vaccine to 115 countries and economies. Furthermore, the U.S. continues to support international efforts to expedite global access to COVID-19 vaccines and therapies. We also continue to support international efforts to expedite global access to COVID-19 medical countermeasures (MCMs). Several scientifically rigorous Phase III clinical trials have led to emergency use authorization and then licensing of COVID-19 vaccines and therapies by the United States Food and Drug Administration and other rigorous regulatory authorities, such as the European Medicines Agency. MCM development and clinical trials continue with the goal of expanding options available to prevent infections, as well as to improve treatment of patients with COVID-19.

163. The U.S. commitment to bring COVID-19 under control and to undertake preparedness measures to prevent or counter future outbreaks of pandemic concern is demonstrated through numerous initiatives aiming to strengthen global health frameworks and improve clinical research response capacity in partnership with other nations and with multilateral institutions, including the WHO. Some of these initiatives are described below:

- The COVID-19 pandemic has highlighted the need for expanded manufacturing infrastructure, capability, and workforce to produce vaccines. In this context, helping other countries enhance their own capabilities to produce vaccines in turn helps the

entire world combat health threats. That is why our experts in the Biomedical Advanced Research and Development Authority (BARDA) in the Administration for Strategic Preparedness and Response (ASPR, U.S. Department of Health and Human Services) are collaborating with governments around the world to develop manufacturing capability to produce vaccines in their home countries. The most recent example is the Republic of South Africa, where vaccine manufacturing companies have identified a shortage of experienced technical experts as an obstacle to in-country production; this need led the South African Medical Research Council (SAMRC) to collaborate with BARDA's Division of Pharmaceuticals Countermeasure Infrastructure (PCI) on a current Good Manufacturing Practices (cGMP) train-the-trainers program. With BARDA's participation and support, this training began in July 2022. Members of South African universities, upon completion of the course, will establish their own program in South Africa to train other professionals from their own country as well as elsewhere in Africa through the SAMRC. The ripple effects of this program will enhance the ability of entire nations to bring infectious disease threats under control more quickly, in the process reinforcing global health security.

- The U.S. Department of Defense (DOD) is also collaborating with many countries in the fight against COVID-19. For example, in Georgia scientists trained through the DOD Cooperative Threat Reduction (CTR) Program are now working in the National Center for Disease Control and Public Health (NCDC) at the CTR-constructed Richard Lugar Center developed a Real-Time Polymerase Chain Reaction (RT-PCR) diagnostic testing capability for COVID-19. This diagnostic testing capability enabled Georgia to implement the WHO advice for diagnostic testing to inform outbreak control. Georgian Prime Minister Giorgi Gakharia visited the Lugar Center on 21 June 2020 and highlighted its enormous contribution to Georgia's fight against the COVID-19 pandemic, adding that it is due to the professionalism and enormous efforts of the Center's staff that the country's epidemiological situation is under control.
- The investments of the Fogarty International Center at the U.S. National Institutes of Health (NIH) in the scientific workforce and collaborative networks enabled researchers around the world to quickly respond to COVID-19. Past and current grantees and trainees played major roles in the research response to the pandemic in their countries including China, Haiti, Peru, and South Africa, while also providing expert analysis to policymakers. Fogarty grantee Dr. Christian Happi of Nigeria was the first to sequence the full COVID-19 viral genome in Africa and continues to lead the scientific response to the pandemic in his country. Recently, Fogarty further supported this powerful research network by awarding \$3.3 million in administrative supplements to support research on unique scientific questions and research training activities related to COVID-19.

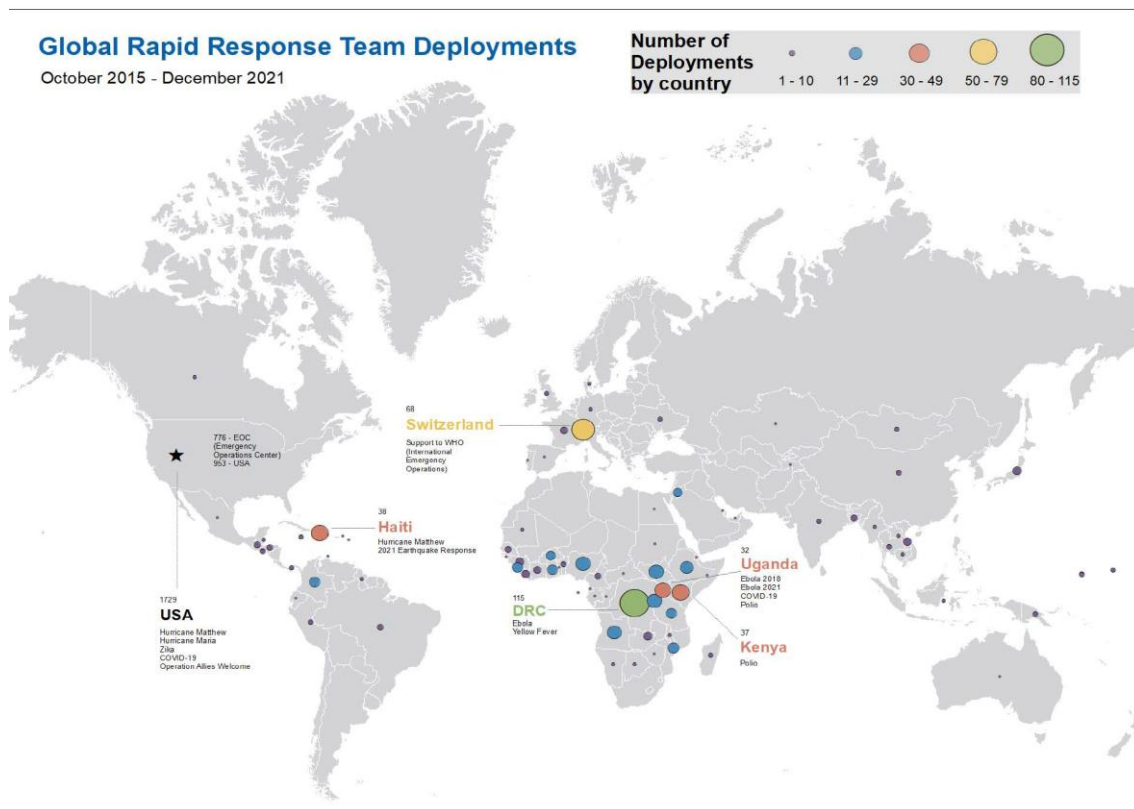
#### **IV. Efforts to facilitate the fullest possible exchange of biological equipment, materials, and information for peaceful purposes**

##### **A. Disease surveillance, detection, and response**

164. The Center for Disease Control and Prevention (CDC) is the United States' lead agency for disease detection. It works in partnership with countries to develop sustainable capacities for disease surveillance and response activities, including establishing or strengthening centers called national public health institutes. The CDC collaborates with public health agencies, health ministry counterparts, non-governmental organizations, and others worldwide to address known and unknown global health threats. The CDC Center for Global Health's Division of Global Health Protection provides capacity-building, training, and educational support to other countries through its Global Disease Detection Program, Emergency Response and Recovery Branch, and Field Epidemiology Training Program (FETP). The CDC has also created a cross-agency rapid response team for international deployment, and CDC staff are often involved in international response efforts. Thanks to decades of global cooperation to control diseases, the CDC has built a strong foundation upon

which to address the coronavirus pandemic including helping countries improve the linkages and coordination within the public health workforce through national public health institutes.

165. Through CDC's Global Emergency and Alert Response Service (GEARS), up to 40 public health events are monitored per day worldwide. Since its inception in 2007, it has reported more than 1,800 events (over 1,200 of which were of international importance), including 189 different diseases in over 240 countries and territories. Over 500 CDC experts are ready to deploy globally in response to a public health emergency through GEARS.<sup>37</sup> In response to the COVID-19 pandemic, the CDC developed disease-specific guidelines to streamline Rapid Response Team operations for CDC staff working outside the United States. In support of the WHO and worldwide health professionals, the CDC also developed the COVID-19 National Rapid Response Teams Online Learning Package.<sup>38</sup>



166. Through programs such as the FETP, the CDC works with partners across the world to develop a global workforce of field epidemiologists. Since its inception in 1980, the CDC has helped train more than 21,000 public health workers epidemiologists in more than 80 countries through FETP.

167. Another example of the CDC's support to other countries is through the Public Health Emergency Management (PHEM) Fellowship managed by the Division of Emergency Operations, Global Emergency Management Capacity Development Team.<sup>39</sup> Established in 2013, the 3-month program, based at CDC Headquarters in Atlanta, Georgia, aims to build and nurture a global network of practice of trained experts to establish public health emergency management programs and public health emergency operations centers (PHEOCs) in their respective countries. 152 fellows from 40 countries have completed the program. PHEM Fellowship alumni have played key roles in the expansion of public health emergency management within their countries. Overall, they have assumed leadership

<sup>37</sup> The map is from "Global Emergency Alert and Response Service (GEARS), Centers for Disease Control and Prevention, March 3, 2022.

<sup>38</sup> "Health Security Learning Platform in the Context of the IHR - RRT Learning Programme for COVID-19," <https://extranet.who.int/hslp/training/course/index.php?categoryid=60>.

<sup>39</sup> "Public Health Emergency Management Fellowship," Centers for Disease Control and Prevention, <https://www.cdc.gov/cpr/eoc/EmergencyManagementFellowship.htm>.

positions in public health responses to threats such as polio, Ebola, measles, and COVID-19. Examples of PHEM Fellowship alumni roles include Incident Managers for national responses in Burkina Faso, Cameroon, Liberia, and Japan. Some graduates have provided support to other countries. Nigeria, for example, hosted delegates from the Zambian National Public Health Institute to share best practices on establishing a national PHEOC and PHEM program. Examples of leadership roles fellows have taken on after their training include Kenya's Ministry of Health Director of the Disaster Risk Management Unit and Thailand's Manager of the Emergency Operation Center in the Ministry of Public Health Department of Disease Control.

168. The United States Department of Agriculture (USDA) Agricultural Research Service (ARS) is actively engaged in implementing research programs that help prevent, detect, or improve surveillance of plant and animal diseases, including emerging diseases and zoonotic agents that pose a threat to human health. ARS also actively collaborates with international partners worldwide on research projects dedicated to supporting disease surveillance programs for transboundary animal diseases. ARS is one of the founding members of the Global Foot-and-Mouth Research Alliance and the Global African Swine Fever Research Alliance and is an active member of the global network of expertise on animal influenza (OFFLU), which supports the Food and Agriculture Organization of the United Nations (FAO) and World Organization for Animal Health (WOAH) global efforts to control and eradicate transboundary animal diseases that affect the health of animals and people worldwide. ARS also partners with the American Biosafety Association to conduct biosafety training relevant to agriculture to many national and international participants at a biennial symposium.

169. The USDA Animal and Plant Health Inspection Service (APHIS) manages overseas capacity building for agricultural safeguarding, including: 1) emergency preparedness and response, and 2) prevention and control of transboundary animal diseases, particularly highly pathogenic avian influenza, and African swine fever. These programs advance food security by promoting animal health (e.g., improved diagnostic laboratory and disease management techniques), developing local food supply chains, and teaching farmland and watershed management. This leads to sustainable improvements in animal and plant health infrastructure and reduced pest and disease risk. The programming also promotes cooperation with international organizations and their scientific and regulatory personnel, leading to enhanced capacity building and regulatory development. APHIS has expertise and programs in animal and plant disease, surveillance, exclusion, information systems, emergency response, and vaccination and delivers this expertise internationally to more than 100 countries.

170. APHIS also regulates animal vaccines and diagnostic products for diseases that affect both animals and people worldwide. APHIS' Center for Veterinary Biologics (CVB) authorizes the release of approximately 100 billion doses of product each year, with nearly 50% exported to international markets. CVB is a World Organization for Animal Health collaborating center for animal vaccine approvals, provides annual guidance to worldwide partners via the Institute for International Cooperation in Animal Biologics and is a member of the Veterinary International Conference on Harmonization to harmonize international requirements for veterinary product registration.

171. APHIS also operates the National Veterinary Services Laboratories (NVSL), which provides high quality diagnostic services in support of animal health worldwide. The NVSL serves as a WOA and FAO reference laboratory and actively collaborates with international partners to support animal disease surveillance and diagnostic testing programs. NVSL has recently partnered with eight international institutions for surveillance and timely detection of high-consequence animal and zoonotic diseases. The NVSL is an active member of OFFLU, which supports the FAO and WOA global efforts to control and eradicate transboundary animal diseases that affect the health of animals and people worldwide and is a WOA Collaborating Centre for Diagnosis of Animal Diseases.

172. The NVSL has conducted diagnostic testing, produced, and distributed diagnostic reagents, and provided proficiency test panels for international partners on a range of diseases, including brucellosis, tuberculosis, glanders, dourine, piroplasmosis, avian influenza, Newcastle disease and African swine fever. NVSL has worked internationally to

build capacity and harmonize methods through activities such as participating in the North American Animal Health Laboratory Network (NAAHLN); collaborating with Canada and Mexico to address bovine tuberculosis and brucellosis; publishing genomic data for agents and diseases including SARS-CoV-2, *Streptococcus equi* zooepidemicus, *Mycobacterium bovis*, vesicular stomatitis virus, Newcastle disease, and African swine fever; and providing scientific expertise and support to international partners by serving as subject matter experts on WOA, FAO, and OFFLU committees. NVSL actively shares knowledge on animal disease and diagnostic topics through publication of scientific advances in peer-reviewed journals and through participation in and presentations at international forums such as the WHO Consultation and Information Meeting on Composition of Influenza Virus Vaccines, the International Alliance for Biological Standardization annual meeting, and the Joint Annual Meetings of the National Reference Laboratories for Avian Influenza and Newcastle Disease of European Union Member States.

173. The Armed Forces Health Surveillance Branch's Global Emerging Infections Surveillance Section (GEIS) enhances health protection through an integrated worldwide military laboratory network that conducts emerging infectious disease surveillance. GEIS provides direction, funding, and oversight to this laboratory network, which works with more than 50 international partners based in all regions of the world. These partners conduct disease surveillance and rapid outbreak response, perform innovative pathogen discovery activities, and enhance coordination and collaboration efforts between DOD agencies and international partners to facilitate information sharing and early detection of emerging infectious disease threats. GEIS encourages its partners to present and publish their findings in medical journals, global health security publications, and at scientific meetings and to comply with the International Health Regulations.

174. GEIS projects addressed four focus areas, including enteric infections, respiratory infections (including providing input to the WHO influenza vaccine strain selection process), febrile and vector borne infections, and antimicrobial resistant infections (to include resistant *Neisseria gonorrhoea*).

175. The U.S.-led "Action Plan on Health and Resilience in the Americas," focuses on prevention of, preparation for, and responses to future pandemic threats and other public health emergencies while also expanding the equitable delivery of healthcare and public health services to remote, vulnerable, and marginalized populations. The United States will enhance regional health security by, among other things, strengthening surveillance networks, laboratories, and data modernization in South and Central America through development and improvement of National Public Health Institutes; strengthening partnerships with private, non-governmental, and international organizations to improve global health security in intensive support countries and throughout the region. This effort aims to identify and engage new partners to join the GHSA Legal Preparedness Action Package to build capabilities in countries to map, develop, refine, and utilize legal frameworks and authorities to prepare for and respond to health emergencies.

## **B. International collaboration and exchange programs for scientific research**

176. The United States views programs that promote science education, train young scientists, and provide opportunities for international researcher-to-researcher collaborations as essential to the fulfillment of our Article X obligations. Such programs are mutually beneficial for all participating countries and contribute to the furtherance of scientific progress.

177. The Department of State's Office of Science and Technology Cooperation (OSTC) implements capacity-building programs and engages with partner nations in dialogue on a range of scientific policy issues. More than 50 bilateral and multilateral science and technology agreements provide a framework for international collaboration on scientific endeavors. Among other efforts, OSTC implements the Science Envoy Program, through which eminent U.S. scientists and engineers build peer-to-peer connections with the scientific communities in partner countries, promote science education, and identify opportunities for ongoing bilateral cooperation.

178. The Department of Health and Human Services supports extensive international research, training, and scientific exchange programs, including:

- The National Institute for Allergy and Infectious Diseases (NIAID) supports global research and research training through multiple collaborative research initiatives that engage counterpart foreign institutions. Some research programs also facilitate global pandemic preparedness by fostering global research collaboration, which enables strengthening of infectious disease research capabilities worldwide. The Institute published the NIAID Pandemic Preparedness Plan in December 2021, outlining its strategy to target ‘prototype’ and priority pathogens, using a preemptive approach designed to identify viral threats before they emerge. Strengthened capacity to detect, characterize, and respond to emerging pathogens with pandemic potential is a primary defense against future emerging or re-emerging infectious diseases growing from isolated outbreaks to global pandemics. Rapid development of vaccines, therapeutics, and diagnostics in response to novel pathogens – so central to mitigating the COVID-19 – benefits from widely distributed research capacity, especially capacity to conduct rigorous, expedited clinical trials on candidate MCMs in populations at risk before global populations are put at risk in a pandemic.
- NIAID’s International Centers of Excellence in Research program fosters research of mutual benefit in disease-endemic countries through partnerships that engage U.S. and foreign scientists who participate in scientific research and training both in the U.S. and overseas. The Fogarty International Center at the National Institutes of Health is dedicated to advancing the Institutes’ mission by supporting and facilitating global health research conducted by U.S. and international investigators, building partnerships between health research institutions in the U.S. and abroad, and training the next generation of scientists to address global health needs. More than 7,500 individuals from 132 countries have trained through Fogarty programs since 1989.
- NIAID Global Infectious Disease Research Administration Development Award for low- and middle-income countries’ institutions provides advanced training in the management of NIH grants to assure the efficient implementation of NIAID- funded research of importance to address disease outbreaks. The overall intent of the initiative is to support the training of senior science administrators so they can serve as institutional grant management leaders. With such skills in place, particularly in low- and middle-income countries, the world is better enabled to undertake international collaborations that are essential to assure emerging or re-emerging diseases are rapidly investigated to develop urgently needed medical countermeasures.
- The National Cancer Institute’s Short Term Scientist Exchange Program facilitates scientific interactions between non-U.S. scientists and researchers at NCI.
- The Food and Drug Administration (FDA)’s Foreign National Training Program enables researchers from foreign countries to initiate and conduct research that complements projects at the FDA’s National Center for Toxicological Research.

179. The Foreign Agricultural Service (FAS) links U.S. agriculture to the world to promote American agricultural products and exports. FAS implements USDA international fellowship programs and non-emergency assistance programs that mutually benefit the United States and partner countries to help facilitate agriculture-led economic growth and increase participation in international agricultural trade. These FAS programs link U.S. and foreign scientists, policymakers, and other stakeholders to address shared priorities, including, but not limited to, trade-related aspects of plant and animal health and food safety. For example, recent participants in the FAS Borlaug Fellowship Program and Cochran Fellowship Program have worked on drought tolerant rice varieties, the biophysical impact of water availability on cocoa, the identification of genes associated with wheat improvement and disease resistance, and risk management of livestock diseases. FAS programs also promote U.S. international cooperation on other mutually beneficial applications of life sciences, such as biotechnology for improving crop traits.

180. The National Academies of Sciences, Engineering, and Medicine, in cooperation with sponsoring federal laboratories and other research organizations, conducts the National Research Council Research Associateship Programs, which have supported the research of

more than 14,000 scientists and engineers since their establishment in 1954. The goal of these programs is to provide advanced training and collaborative research opportunities for highly qualified postdoctoral and visiting scientists, while enhancing the research conducted in federal laboratories and affiliated institutions.

### C. Capacity enhancement and global health security

181. The United States is a founding member of the Global Health Security Agenda (GHSA), a multilateral initiative launched in 2014 by 20 countries to accelerate compliance with the 2005 International Health Regulations (IHR). The IHRs, a legally binding instrument now adopted by 196 countries, aims to strengthen country-level capabilities needed to prevent, detect, and respond to health emergencies. From its inception, GHSA has been a catalyst for progress to protect the world from global health threats posed by infectious diseases, whether caused naturally, deliberately, or accidentally. This collaborative multisectoral initiative now includes 70 countries, international organizations, non-governmental organizations, and the private sector with the objective of strengthening global health security.

182. Agencies across the United States Government work with ministries of health, agriculture, environment, and other key stakeholders in partner countries to expand capabilities to detect viral pathogens with pandemic potential, improve laboratory surveillance, strengthen disease response, and educate on biosafety and biosecurity.

183. As part of the U.S. commitment to global health security, the U.S. government also partners bilaterally with countries to enhance capacities in health security. These partner countries receive U.S. government program funding and technical assistance and engage with the U.S. government health teams to implement global health security activities. As a key principle, these partnerships work to ensure that all capacities will be sustained by the partner country.

184. U.S. departments and agencies partnered with more than 40 countries in 2021 to provide coordinated operational and technical assistance to build their health security capacities. The list of partner countries receiving intensive support from the U.S. government in 2021 includes Bangladesh, Burkina Faso, Cameroon, Côte d'Ivoire, Democratic Republic of Congo, Ethiopia, Guinea, India, Indonesia, Kenya, Liberia, Mali, Nigeria, Pakistan, Senegal, Sierra Leone, Tanzania, Uganda, and Vietnam.

185. The United States Agency for International Development (USAID) implements the Global Health Security (GHS) Program in partner countries to prevent avoidable outbreaks, detect infectious disease threats early, and respond rapidly and effectively when outbreaks occur. Other USAID global health programs support synergistic health systems strengthening, including building surveillance and laboratory capacities that also increase capacities for global health security. Furthermore, USAID leads U.S. responses to large-scale international outbreaks.

186. USAID's GHS Program collaborates with partner countries and the global community to build better preparedness for future health threats. The Program focuses on building capacities across sectors and multiple technical areas critical to address emerging infectious disease threats, to understand and address risks posed by diseases spilling over from animals to humans and causing epidemics; strengthening national laboratories and disease surveillance systems; improving risk communications in communities; training the next generation of "One Health" workers; addressing the rising threat of antimicrobial resistance; identifying and understanding risks from new and emerging diseases; and supporting vaccine development for high consequence diseases.

187. USAID works collaboratively with other United States Government agencies in 30 countries, which are highly vulnerable to infectious disease threats and/or represent hotspots where the risks of spillover, amplification, and risk of animal-to-human transmission (zoonosis) is greatest. All USAID GHS activities implement the "One Health" approach that brings together the animal, human, and environmental health sectors to address the burden of disease. These investments reinforce public and animal health systems — efforts crucial to saving lives and building resilient local partners and allies — and build the knowledge

base necessary to better understand, prevent, and mitigate the spillover of zoonotic pathogens to human populations and the spread of antimicrobial resistance generated from livestock.

188. Since 2020, USAID has greatly increased its investments in global health security and its GHS Program has launched new projects, including:

- STOP Spillover, which is strengthening capacities to increase our understanding of spillover of known high consequence viruses such as Ebola virus, to develop and implement interventions in communities to reduce contact with animals and risk of infection.
- TRANSFORM, which is working with farmers and the private sector to improve animal health to reduce emerging infectious diseases and antimicrobial resistance in livestock on farms and in markets in Asia and Africa.
- DEEP VZN, which is strengthening country capacities to detect new viruses in wildlife and understand where, when, and how they spillover from animals to humans.

189. These efforts, combined with others, are supporting countries to be better prepared to detect and prevent future epidemics and pandemics.

190. The Assistant Secretary Administration for Strategic Preparedness and Response (ASPR) at the Department of Health and Human Services manages cooperative agreements with partner countries and international organizations to strengthen core public health emergency preparedness and response capacities abroad.

191. ASPR also leads U.S. engagement in the Global Health Security Initiative (GHSI). GHSI is an informal network formed in 2001 to ensure health-sector exchange and coordination of practices in confronting risks to global health posed by chemical, biological, and radio-nuclear threats, as well as by pandemic influenza. The member countries/organizations of the GHSI are Canada, France, Germany, Italy, Japan, Mexico, the United Kingdom, the United States, and the European Commission, with the WHO serving as a technical advisor. The GHSI partners hold an annual meeting of Health Ministers to foster dialogue on topical policy issues and promote collaboration. Other initiatives involving senior health officials, as well as policy, technical, and scientific personnel, take place on a regular basis and focus on risk management, communications, chemical events, radio-nuclear threats, pandemic influenza, and global laboratory cooperation.

192. The Federal Select Agent Program (FSAP) is jointly implemented by the Centers for Disease Control and Prevention's Division of Select Agents and Toxins and the Animal and Plant Health Inspection Service's Division of Agricultural Select Agents and Toxins. FSAP promotes laboratory biosafety and security practices at the international level. FSAP assists federal partners in assessing biosafety/security of international select agent research sponsored by the U.S. government as a condition of funding. Since 2005, FSAP has conducted 76 international assessments to determine equivalencies to U.S. select agent regulations and standards for foreign laboratory operations. FSAP also provides tailored technical assistance to help advance global biosafety and biosecurity to international audiences. FSAP staff have recently been engaged with the Egyptian Civil Sector to discuss and update their existing biosafety and biosecurity directives, regulations, and organizational structure. FSAP is hoping to continue to augment our existing international outreach efforts so that we can help enhance biosafety and biosecurity in the global arena. That means preventing disease spread, promoting safe laboratories, and applying scientific expertise to peaceful purposes.

#### **D. Other improvements in global health**

193. The United States has been a major contributor to the Global Fund to fight AIDS, Tuberculosis, and Malaria, as well as several other multilateral health organizations, including the Joint United Nations Program on HIV/AIDS, the World Health Organization, the International AIDS Vaccine Initiative, and Gavi, the Vaccine Alliance. Through the U.S. President's Emergency Plan for AIDS Relief, the U.S. government has invested nearly \$100 billion in the global HIV/AIDS response, the largest commitment by any nation to address a single disease in history, saving 21 million lives, preventing millions of HIV infections, and accelerating progress toward controlling the global HIV/AIDS pandemic in more than 50



countries. The United States Government is a leading supporter of Gavi, contributing over \$7 billion since 2001, towards the prevention of the spread of infectious diseases worldwide. This funding will strengthen the global vaccine infrastructure that could serve as a foundation for future COVID-19 vaccination efforts.

## **V. Contributions to the development and application of scientific discoveries in the life sciences**

194. The United States has long been a global leader in life sciences research, leading the research and development spending. The United States Government provides the support and environment that enables scientists to participate in and foster the exchange of ideas that advances knowledge sharing in the life sciences. American universities, biotech companies, and individual biologists also drive both basic science and its application. In the United States, the private sector funds and performs most of the research and development (R&D) overall, as well as most of the applied research and experimental development. Higher education institutions represent the second-largest performer of R&D overall and perform the largest share of basic research. American colleges and universities also engage in joint research with colleagues across the globe and educate many of the world's emerging scientists through undergraduate, graduate, and post-graduate training. The United States attracts the largest number of international students in the world.

195. The National Institutes of Health (NIH) spearheaded the rapid research response to the COVID-19 pandemic, pioneering safe, effective vaccines and therapeutics in partnership with industry, BARDA, and other agencies. NIH carries out cutting-edge scientific investigations and funds a large proportion of medical research carried out in academic and medical institutions. Within the NIH, the Centers of Excellence for Influenza Research and Response program is a collaborative network of centers that provides the information and research response tools needed to control the impact of epidemic influenza and the threat of pandemic influenza and other respiratory viruses, including SARS-CoV-2. The expeditious development and deployment of vaccines, therapeutics, and diagnostics, in response to the COVID-19 pandemic, with successful vaccines reaching populations less than a year after the severe acute respiratory system coronavirus 2 (SARS-CoV-2) was identified, was based on many years of research in several fields, much of it supported or carried out by NIAID and other centers and institutes of the NIH, working with many partners. NIAID is leading on efforts to develop a "prototype pathogen" approach to develop MCMs against the estimated 26 virus families including species known to infect humans, with the goal of further reducing the time required to deploy safe and efficacious MCMs against pathogens with pandemic potential.

196. Also essential to pandemic preparedness is improved medical research capacity everywhere viruses could arise. The United States Government is engaged in both bilateral and multilateral partnerships to build or bolster research capacity where it is most needed. For example, the NIH/Centers for Research in Emerging Infectious Diseases (CREID) program aims to improve pandemic preparedness through the establishment of a coordinated network of emerging and re-emerging viral infectious disease researchers in regions around the globe where emerging and re-emerging viral infectious disease outbreaks are likely to occur. Multidisciplinary teams of investigators conduct pathogen/host/vector surveillance, study pathogen transmission dynamics, pathogenesis, and host immunologic responses, and develop reagents and diagnostic tools for improved detection for important emerging pathogens. The CREID Network aims to develop a framework and infrastructure that will enhance domestic and international research capacities to respond quickly and effectively to future outbreaks.

197. NIAID was able to call on the existing HIV/AIDS Clinical Trials Networks (HCTN) to facilitate clinical research in the emergency response to COVID-19 and is supporting additional efforts to coordinate clinical research and ensure that new outbreaks are met with well-planned, sufficiently powered research rather than the plethora of small, inconclusive efforts that bedeviled early response to SARS-CoV-2.

198. The National Science Foundation (NSF), an independent federal agency with a 2021 budget of \$8.8 billion, promotes international activities and fosters institutional frameworks that facilitate international cooperation in research and education. These activities are widely distributed across the world and range from work in the world's most advanced science and engineering laboratories to observation of physical, biological, and human phenomena around the globe.

199. The U.S. Department of State's Office of Science and Technology Cooperation (STC) negotiates science and technology agreements, facilitates technical cooperation under those agreements, and engages with allies and partners on a range of science, technology, and innovation issues. Currently, the United States is party to 50 bilateral and multilateral science and technology agreements that provide frameworks for scientific collaboration. Among other efforts, STC implements the U.S. Science Envoy Program, through which eminent U.S. scientists and engineers build connections with the scientific communities in partner countries, promote science education, and identify opportunities for ongoing bilateral cooperation. STC also administers the Embassy Science Fellows Program, which dispatches U.S. government scientists to U.S. embassies for temporary assignments related to environment, science, technology, health, and other issues.

200. The National Academies of Sciences, Engineering, and Medicine, in cooperation with sponsoring federal laboratories and other research organizations, conducts the National Research Council Research Associateship Programs, which have supported the research of more than 14,000 scientists and engineers from all over the globe since their establishment in 1954. The goal of these programs is to provide advanced training and collaborative research opportunities for highly qualified postdoctoral and visiting scientists, while enhancing the research conducted in federal laboratories and affiliated institutions. NAS' International Networks and Cooperation Theme is a key resource and mechanism for U.S. government agencies, public interest foundations, science, engineering, and medical organizations, and the Academies themselves for new international engagements, participation in international organizations, and sustained engagement with international counterparts on important topics.<sup>40</sup>

- The CDC's Epidemic Intelligence Service (EIS) is a two-year training program for health and veterinary professionals interested in applied epidemiology. Primarily a domestic program for the training of "Disease Detectives", the EIS program also accepts a limited number of non-U.S. citizens each year.
- The CDC's Field Epidemiology Training Program (FETP) (see above).

201. DOD provides an opportunity for U.S. military and civilian scientists to conduct research in foreign government laboratories and for foreign military and civilian counterparts to work in U.S. Department of Defense laboratories, through the Engineer and Scientist Exchange Program. The Department has signed with 16 countries formal international agreements with reciprocal working arrangements for scientists in governmental and defense organizations.

202. The Foreign Agricultural Service links U.S. agriculture to the world to enhance export opportunities and global food security. FAS implements USDA international fellowship programs and non-emergency assistance programs that mutually benefit the United States and partner countries to help facilitate agriculture-led economic growth and increase participation in international agricultural trade. These FAS programs link U.S. and foreign scientists, policymakers, and other stakeholders to address shared priorities, including, but not limited to, trade-related aspects of plant and animal health and food safety. For example, recent participants in the FAS Borlaug Fellowship Program and Cochran Fellowship Program have worked on drought tolerant rice varieties, biophysical impacts of water availability on cocoa, the identification of genes associated with wheat improvement and disease resistance, and risk management of livestock diseases. FAS programs also promote U.S. international

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<sup>40</sup> "International Networks and Cooperation," National Academies of Sciences, Engineering, and Medicine, <https://www.nationalacademies.org/networks/international-networks-and-cooperation>.

cooperation on other mutually beneficial applications of life sciences, such as biotechnology for improving crop traits.

203. Additionally, many non-governmental organizations and foundations based in the United States promote engagement among scientists from around the world. Some of these entities explicitly sponsor the scientific development of foreign researchers, other non-governmental organizations host scientific exchanges and fora to bring scientists together to share best practices and lessons learned and to highlight the role of science in society. One noteworthy example is the Intel International Science and Engineering Fair (ISEF), a program of the Society for Science and the Public. ISEF is the world's largest pre-college science competition, with \$8 million in awards, judged by doctoral-level scientists.<sup>41</sup> Each year more than 1,800 ninth through twelfth graders earn the right to compete at Regeneron ISEF and can win cash awards, scholarships, internships, and other prizes by participating at a Society-affiliated local, regional, state, or national science fair. In addition to the top winners, approximately 600 finalists received awards and prizes for their innovative research. The American Society for Microbiology (ASM) also has a robust program to engage international partners and foster collaboration and partnership; its premier event, ASM Microbe, is the largest gathering of microbiologists from across the globe and provides a forum to explore the full scope of microbiology. The 2022 event gathered over 4,500 attendees. The ASM Microbe Online enabled participants to explore research from peers with thousands of e-posters, hear from experts in the field during live keynotes, and access track-related content with a curated selection of on-demand sessions. ASM also regularly hosts conferences focusing on specialized areas, including clinical virology, biodefense, and emerging infectious diseases.

204. In the spirit of transparency in science, the United States supports “open access” – the principle of making government-funded research results broadly available and free of charge. Open access databases promote collaboration, facilitate the spread of expertise throughout the globe, and reduce the costs associated with distributing scientific information and sharing results. In furtherance of the goal to make the results of federally funded research more accessible and without delay, in August 2022, the White House's Office of Science and Technology Policy directed all federal departments and agencies to update their public access policies as soon as possible, and no later than December 31st, 2025, to make publications and their supporting data resulting from federally funded research publicly accessible and waiving the optional 12-month embargo that had been allowed by the original 2013 “open access” memorandum. The 2013 memorandum directed all federal departments and agencies with more than \$100 million in annual research and development expenditures to develop a plan to support increased public access to the results of federally funded research but allowed a 12-month embargo from public access. The optional embargo period limited access of federally funded research results to only those able to pay for it or who have privileged access through libraries or other institutions. The new guidance acknowledges that financial means and privileged access must never be the pre-requisites to realizing the benefits of federally funded research that the scientific community deserves.

205. In addition, many U.S. colleges and universities have adopted open access policies requiring researchers to make publications available free of charge. A growing number of major U.S. institutions are also making undergraduate and even some graduate courses freely available online. The Johns Hopkins Bloomberg School of Public Health the Massachusetts Institute of Technology, Stanford University, and Yale University are among the U.S. universities providing free and open access to a variety of courses through their own websites or through online platforms such as Coursera or edX.

206. The Training Finder Real-time Affiliate Integrated Network (TRAIN) is funded in part by the CDC and managed by the Public Health Foundation (PHF), a private, non-profit organization. TRAIN is a web-based learning network for agencies and organizations that delivers, tracks, and shares trainings for professionals who protect the public's health. The national TRAIN network is currently made up of 26 state health departments and three federal agencies (CDC, Medical Reserve Corps, and Veteran's Health Administration) and is available worldwide. Each has its own online portal into the national TRAIN network that allows these agencies to share courses with a growing learning system of more than one

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<sup>41</sup> “Regeneron ISEF Awards,” Society for Science, <https://www.societyforscience.org/isef/awards/>.

million registered learners. TRAIN offers health professionals access to courses on a wide array of public health topics in a variety of formats, including classroom training, webinars, and online self-study options. Such online and distance learning opportunities enable the exchange of information between public health professionals and organizations and promote the development of public health workforces worldwide.

207. Researchers are turning to the most powerful high-performance computing resources available to gain a better understanding of COVID-19. In early March 2020, NSF made all its computing resources accessible to the scientific community. NSF co-led the establishment of the COVID-19 High Performance Computing (HPC) Consortium, a new public-private consortium that is bringing together the U.S. government, industry, and academic leaders to provide access to the world's most powerful high-performance computing resources in support of COVID-19 research.<sup>42</sup>

## **VI. Efforts to avoid hampering the economic and technological development of States Parties or International Co-operation in the field of peaceful bacteriological (biological) activities**

### **A. Facilitating National Implementation of the Convention**

208. Implementation of the BWC's Articles III and IV help States Parties prevent the misuse of the life sciences and biotechnology as they fulfill their Article X undertakings to facilitate exchange for peaceful purposes. Indeed, effective national implementation measures by States Parties are a key means of achieving the aims of Article X. Through a range of assistance and cooperation activities, the United States works with other BWC States Parties to implement the Convention.

209. In 2020, the U.S. State Department launched a project to create an electronic platform containing information on States Parties' implementation of the BWC, and we are now working with the United Nations Institute for Disarmament Research (UNIDIR) to develop this tool. We hope the platform will provide States Parties a rich depository of best implementation practices and assist them in their own efforts. In addition to the database, this funding supports projects to assist countries with BWC implementation challenges. The first of those pilot projects will take place in Kenya.

### **B. Export Controls and Related Measures**

210. The U.S. Export Control Reform Act (ECRA) (50 U.S.C. 4801–4852), signed into law in 2018, is designed to be fast, transparent, and effective in fulfilling BWC Article III and UNSCR 1540 obligations to guard against the risks of proliferation and terrorism, while minimizing the impact on international cooperation. In coordination with several other departments and agencies, the Department of Commerce's Bureau of Industry and Security (BIS) administers and enforces controls on the export of commercial items that can also be used in conventional arms, weapons of mass destruction, terrorist activities, or human rights abuses. However, a very low percentage of overall trade is subject to this licensing system and a much lower portion of that is actually barred. Of the \$49.6 billion in combined U.S. exports in the biotechnology and life sciences, only about 0.1% (\$60.8 million) was subject to the U.S. Department of Commerce's license requirements. In the most recent period for which data is available, from October 1, 2021, to August 31, 2022, the U.S. exported \$49.6 billion worth of advanced technology products in the categories of biotechnology (\$16.5 billion) and life science (\$33.0 billion).

211. The United States believes that partnerships for capacity-building and other forms of assistance to partner nations, whether by governments, international organizations, academic institutions, or private industry, benefit both parties in terms of economic and scientific development and fulfilling commitments under the BWC. However, a number of obstacles

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<sup>42</sup> "The COVID-19 High Performance Computing (HPC) Consortium," <https://covid19-hpc-consortium.org/>.

to successful implementation of Article X could be reduced by recipient countries to further promote the fullest possible exchange of equipment, materials, and information.

212. Effective and predictable intellectual property right (IPR) regulations provide an important incentive for investments in innovation and facilitate exports around the world. The lack of effective protection and enforcement for IPR can dissuade those holding the rights from investing in a country and collaborating with their institutes or academies. Strengthening IPR regulations by ensuring that relevant laws are enforced and include rigorous penalties can deter potential traffickers, provide patent holders tools for defending against infringement, lower costs for manufacturers, and provide incentives for those holding the IPR to enter new markets.

213. Comprehensive and uniform regulations support long-term research and development collaborations. Unfortunately, regulatory agencies in many countries lack adequate training and resources to review patent and other regulatory applications in a timely and consistent manner, creating enormous backlogs, approval uncertainty, and market access delays. Predictable and robust legal and regulatory regimes are critical to promote investment. High tariffs, taxes, and other fees also present significant market access barriers. These markups often increase the end-user price of medicines significantly, sometimes by more than 80 percent. Not only do such expenses unnecessarily increase drug costs to patients, but they also often slow product delivery. Non-tariff measures, such as customs delays or rules of origin, are less visible impediments that can also make it difficult for the pharmaceutical or biotechnology industry, or academic or government programs, to provide equipment or materials to support collaborative efforts. Such delays can be a significant deterrent to ongoing commitments to provide assistance and resources.

214. The U.S. Department of State's Export Control and Related Border Security (EXBS) Program works with partner countries to fulfill the Article III obligations, which calls States Parties not to transfer biological weapons. EXBS collaborates with partner countries to develop ways to prevent the proliferation of weapons of mass destruction (WMD) and help to develop effective national strategic trade control systems in countries that possess, produce, or supply strategic items, as well as in countries through which such items are most likely to transit. To achieve this goal, the EXBS Program works with partner governments to identify regulatory and institutional gaps and strengthen partner countries' legal authorities and institutional capabilities. The EXBS Program provides a wide range of technical assistance including executive exchanges, training workshops, provision of detection equipment, and specialized training for border control and enforcement agencies.

215. The EXBS Program is active in over 50 countries and draws on the expertise and cooperation of a range of U.S. government departments and agencies, the private sector, and domestic and international non-governmental organizations to provide legal, licensing, and enforcement training, along with information systems and equipment. By strengthening the capacity of trade and border control systems, the EXBS Program helps partner countries adhere to the guidelines of multilateral export control regimes and meet their obligations and commitments to important international initiatives, including BWC Article III, United Nations Security Council Resolution (UNSCR) 1540, and the Proliferation Security Initiative.

216. Building on years of work with critical partner countries to address the greatest threats at land, sea, and air borders, our EXBS Program is now providing those partners with the training and guidance needed to manage points of entry effectively and safely in the COVID-19 environment. Through delivery of tailored instructional materials, operational guidance, and other assistance, we are helping to ensure partners have the expertise needed to manage the movement of people and goods across borders, while stopping those items that threaten global security.

### **C. Threat reduction**

217. The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (GP) is an international initiative aimed at preventing the proliferation of chemical, biological, radiological, and nuclear weapons, and related materials. Biological threat reduction programs that support the GP's Biosecurity Sub-Working Group (BSWG)

has, for over a decade, collectively invested significant resources to build and strengthen capabilities in partner countries to prevent, detect, and respond to biological threats. This includes activities to strengthen biosafety and biosecurity practices and infrastructure, improve biosurveillance and disease detection capabilities, develop national and regional frameworks to identify and respond to biological incidents, and support biological nonproliferation efforts at the national and subnational level. These efforts result in a decreased likelihood that actors with ill intentions may acquire knowledge or material that could be used for malicious purposes, a decreased likelihood of accidental release of pathogens, and an increased ability to prevent sustained outbreaks and the further spread of diseases. This has been demonstrated during the COVID-19 pandemic, where U.S. biosecurity threat reduction programs have contributed to global response efforts by continuing to build and adapt programming to protect life, enhance international security, and help prevent future catastrophes.

218. Under the U.S. Presidency in 2020, the BSWG agreed to develop and implement a holistic Signature Initiative to mitigate biological threats collectively with concrete activities advancing shared objectives and priorities that are well-coordinated across the BSWG and GP member countries. Over the past two years, the U.S. has continued to support the Global Partnership's Biosecurity Signature Initiative to Mitigate Deliberate Biological Threats in Africa undertaken in collaboration with the Africa Centres for Disease Control and Prevention (Africa CDC). This includes involvement in working groups aimed at information sharing and project development focused on biosafety and biosecurity, national governance frameworks, disease detection and epidemic intelligence, and biological nonproliferation and supporting activities in these areas to strengthen the capacity of African partners to detect, prevent, and respond to biological threats. For example, the United States is supporting efforts to promote universalization and strengthen national implementation of the BWC and assisted in the establishment of the first Regional Center of Excellence for Biosafety and Biosecurity training for Africa CDC.

219. The U.S. Department of State's Bureau of International Security and Nonproliferation (ISN) has various programs that support biological threat reduction and biological nonproliferation efforts around the world. These programs operate closely together to strengthen global and multisectoral biosafety and biosecurity and proactively mitigate biological threat gaps and requirements. One example of collaboration is an effort in Southeast Asia to reduce the risks of pathogen spillover from animals to humans by developing implementable biosafety and biosecurity guidelines for high-risk points within the live animal supply chain in the region.

220. ISN's Biosecurity Engagement Program (BEP) works in partnership with nearly 40 countries around the world to promote and strengthen safe, secure, and sustainable biological capabilities. BEP utilizes a multisectoral approach to biological threat reduction and engages government stakeholders in the public health, animal health, and law enforcement sectors, as well as academia and industry, to mitigate the threat posed by biological agents. For example, BEP collaborated with partners in Africa, the Middle East, and Southeast Asia to develop, implement, and operationalize sample management and inventory tools that ensure biological materials are safely and securely stored. In Southeast Asia, BEP supported efforts to develop policies and regulatory frameworks to strengthen biorisk management, implement biosafety and biosecurity best practices, and promote networking of regional and national laboratories across public health, animal health, and academic sectors. BEP also is working with countries in Africa and the Middle East to strengthen national and regional laboratory systems through the development of data, information, and sample sharing frameworks that can be used to better coordinate and communicate across sectors and between countries in the event of an outbreak. In the Middle East, BEP and its partners helped further develop emergency management systems and emergency management coordination to improve responses to biological incidents.

221. During the COVID-19 pandemic, BEP focused some of its biological security assistance efforts to aid in partner countries' response to COVID-19. Programs included increasing safe and secure COVID-19 diagnostic capacity; improving laboratory infection prevention control and hazardous waste management; providing technical assistance for proper sample handling and use of personal protective equipment; and teaching government

officials, laboratorians, and academics how to communicate the risks of COVID-19 accurately and effectively. This work not only supported the COVID-19 response but built capabilities that can be used more broadly to address other biological threats. Similarly, many of BEP's past efforts with partner countries before the pandemic helped build capacity and capabilities that were utilized in response to the COVID-19 pandemic.

222. ISN's Office of Weapons of Mass Destruction Terrorism (WMDT) works with foreign partners to establish, strengthen, and maintain their capabilities to deter, detect, defeat, and respond to terrorist attempts to acquire or use chemical, biological, radioactive, or nuclear materials. WMDT works with partner law enforcement and first responder communities to enhance partner capacity in five key areas: material and information security; investigative capabilities; legislation & prosecution; national, regional, and international information sharing and cooperation; and technical support and expertise. WMDT recently conducted workshops in Sub-Saharan Africa, North Africa, Southeast Asia, and the Middle East that have focused on strengthening biodefense policies and regulations, navigating contaminated crime scenes, and identifying and disrupting clandestine laboratories. Through the ASEAN Regional Forum (ARF), WMDT strengthened partners' coordination of international assistance and critical preparation and response procedures during a biological incident. WMDT's effort through the ARF also highlighted the nexus between law enforcement and biosecurity operations to develop or enhance capabilities to proactively identify, assess, and manage behaviors of concern which could put dangerous pathogens and other valuable biological materials at risk. WMDT in collaboration with ISN/BPS also collaborated multilaterally with the UN and international partners to promote and strengthen the operationalizing of the United Nations Secretary-General's Mechanism to investigate the alleged use of a biological weapon. WMDT recently collaborated with the Department of Defense's BTRP to assist a partner country in its efforts to inform and draft its BWC implementing legislation enabling a whole-of-government approach, and WMDT expects continued collaborative engagement.

223. The U.S. Department of Defense (DOD) Defense Threat Reduction Agency's Biological Threat Reduction Program (BTRP), a component of DOD's broader Cooperative Threat Reduction (CTR) Program, supports 31 partner nations as they seek to improve their capabilities to counter biological threats. The program focuses on the enhancement of partner country and regional biosafety, biosecurity, and biosurveillance capabilities by working cooperatively with foreign partners across Africa, Europe, the Middle East, and Asia. BTRP and these partners work together to identify, consolidate, and secure collections of pathogens as a means of preventing their sale, theft, diversion, or accidental release; enhance biosafety and biosecurity at vulnerable sites; and strengthen the capacity for public health and veterinary health systems to detect, diagnose, and report disease outbreaks rapidly and accurately, in accordance with international reporting requirements and in support of international nonproliferation agreements.

224. BTRP assistance and cooperation activities, like all other U.S.-supported programs, help to fulfill the U.S. commitment to BWC Article X through the peaceful exchange of scientific information, equipment, and materials. The focus of this program is to ensure that partner countries have properly trained staff and the ability to maintain and sustain their facilities. Once BTRP's assistance projects are completed, the partner countries own and operate their own facilities. Foreign partners are responsible for operating and sustaining the training and equipment provided by BTRP, including laboratory infrastructure.

225. BTRP also establishes and enhances international research partnerships between the U.S. and scientists throughout Africa; Central, South, and Southeast Asia; East and Central Europe; and the Middle East. It continues to support training programs in partner countries focused on enhancing the skills essential for effective biosurveillance programs; promoting a culture of safe, secure, and responsible life science research; promoting a One Health approach to health security; and fostering cooperation between health and security sectors to strengthen multi-sectoral capacities to quickly identify, report, and diagnose an unusual biological event. BTRP works with partner countries to identify, prioritize, and address capability and capacity gaps. For example, BTRP has provided diagnostic laboratory renovation, equipment, and training support in several African countries and partnered with

countries in the Caucasus to implement an electronic disease surveillance system to facilitate rapid detection, diagnosis, and reporting of infectious disease outbreaks.

226. Through the DOD CTR Program's long history of supporting partner countries' biosurveillance capabilities, BTRP has cooperated with key nations, international organizations, and other global health security donors for years to build sustainable biosurveillance capabilities with appropriate biosafety and biosecurity practices at national, regional, and global levels. These capabilities have helped bolster partner nations' abilities to quickly detect and diagnose natural outbreaks and pandemics, such as COVID-19. BTRP improves biosurveillance through multiple lines of effort that have been utilized by partner countries in their response to COVID-19, including:

- Constructing, renovating, and equipping laboratory facilities leading national and regional COVID-19 testing efforts. For example, BTRP supported the construction and modernization of a modular diagnostic laboratory (MDL) in the Republic of Guinea. The government of Guinea designated this MDL as the sole laboratory to handle and test all COVID-19 samples across the country. BTRP funded the certification and repair of biosafety cabinets at the MDL to promote enhanced biosafety and biosecurity standard operating procedures required to perform COVID-19 diagnostic activities;
- Standing up Public Health Emergency Operations Centers (PHEOCs). BTRP has helped equip and train professionals to run 24-hour PHEOCs that are coordinating national-level COVID-19 responses. The PHEOC in Senegal, for example, was the epicenter for the country's efforts to combat COVID-19 and a key focal point for information sharing and diagnostic testing coordination for the West Africa region and the African Union Center for Disease Control and Prevention;
- Training and building knowledge. Previous trainings provided by BTRP or supported by BTRP in partnership with other agencies or organizations have prepared public health experts to lead national COVID-19 outbreak investigation and diagnostics. For example, partners at Chulalongkorn University in Thailand used BTRP-provided diagnostic equipment and training to determine the first COVID-19 case outside of China, resulting in early detection and reporting that the disease was spreading outside of China. BTRP continues to provide training to promote biosurveillance capacity building to increase partners' ability to successfully detect COVID-19 and other pathogens.

## VII. Conclusion

227. International cooperation and exchange in the life sciences and biotechnology, including efforts to combat diseases like COVID-19, will continue to be a core mission for the United States, consistent with our obligations under Article X of the Biological Weapons Convention. The United States will continue to commit significant resources to support international cooperation to advance biological science for peaceful purposes; improve global health through the prevention, detection, and mitigation of disease; and prevent the proliferation of biological weapons. Furtherance of these aims has broad support across the full range of U.S. public and private institutions, including governments at all levels, non-governmental organizations, industry, academic institutions, civil society, and the American people.

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