

**“STRENGTHENING NATIONAL, SUB-REGIONAL AND  
INTERNATIONAL CAPACITIES TO PREPARE FOR AND  
RESPOND TO DELIBERATE USE OF BIOLOGICAL  
WEAPONS”**

**Report of the International Seminar  
“Rapid International Response to Biological Incidents:  
Lessons for the Biological Weapons Convention”**

**Geneva, Switzerland  
16 APRIL 2019**

**“EACH STATE PARTY TO THIS CONVENTION UNDERTAKES TO PROVIDE OR SUPPORT ASSISTANCE, IN ACCORDANCE WITH THE UNITED NATIONS CHARTER, TO ANY PARTY TO THE CONVENTION WHICH SO REQUESTS, IF THE SECURITY COUNCIL DECIDES THAT SUCH PARTY HAS BEEN EXPOSED TO DANGER AS A RESULT OF VIOLATION OF THE CONVENTION”.**

**Article VII, Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction**

## Introduction

With funding provided by Japan, the Implementation Support Unit of the Biological Weapons Convention (BWC ISU) organized a seminar on “Rapid International Response to Biological Incidents: Lessons for the BWC” on 16 April 2019 at the Geneva Centre for Security Policy (GCSP) in Geneva, Switzerland. The seminar was part of a larger project on “Strengthening National, Regional and International Capacities to Prepare for and Respond to Deliberate Use of Biological Weapons”, which is implemented by the United Nations Office for Disarmament Affairs (UNODA) from October 2018 to March 2020.

The invited speakers addressed national, regional and international rapid response mechanisms and capacities from different angles. Additionally, the event also represented an opportunity to discuss issues such as interoperability, standardization and training issues regarding rapid response teams. Furthermore, lessons learnt, and challenges faced during previous international response missions were shared among the participants.

This report summarizes the main issues raised by the speakers in their presentations and related discussions. Furthermore, the Seminar Agenda and Speakers’ biographies are annexed to this report.

## Background

Establishing capacities to rapidly deploy teams at the international level to respond to a health emergency has attracted renewed attention after the West African Ebola virus disease (EVD) outbreak in 2014-2015.

The increasing threat of emerging infectious diseases, the potentially dramatic consequences of deliberate bio attacks and the lack of overall global preparedness to respond to bio-threats have all provided further impetus to strengthen rapid response capacities at the national, regional and international level.

Principles which govern the response activities by emergency teams do not differ in the case of a natural outbreak (human/animal/plant scenario) or a deliberate use scenario. Furthermore, and dependent on the scenario, sometime might elapse until a distinction between natural and deliberate bio-event can be made.

Relevant international organizations, such as the World Health Organization (WHO), the Food and Agricultural Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE), have created their own contingency mechanisms for natural outbreak scenarios.

Article VII of the Biological Weapons Convention enshrines an assistance obligation in case a State Party has been exposed to a danger as a result of a violation of the Convention. However, the Convention lacks an operationalized assistance mechanism and also does not have any assets at its disposal.

At its Eighth Review Conference, BWC States Parties noted that “the tragic Ebola outbreak (2014-2015) in West Africa has underlined the importance of rapid detection and prompt, effective, and coordinated response in addressing outbreaks of infectious diseases, and recognizes that these considerations would be relevant as well in the event of alleged use of biological or toxin weapons, which may pose additional challenges”.<sup>1</sup>

Also, at the Eighth Review Conference, States Parties agreed “that the United Nations and other international organizations could also play an important role in coordinating, mobilizing and delivering the required support and assistance. In this respect, the capacities and experiences of UN and relevant international organizations should be identified and used,

<sup>1</sup> [Final Document of the Eighth BWC Review Conference \(BWC/CONF.VIII/4\), Part II \(Final Declaration\) Section G, paragraph 34](#)



*Ambassador Nobushige Takamizawa (Ambassador Extraordinary and Plenipotentiary, Delegation of Japan to the Conference on Disarmament) delivering the welcoming remarks*

within their mandates, when required and upon request of the concerned State Party”.<sup>2</sup>

BWC States Parties have also reached some common understandings on Article VII at the Meeting of Experts in 2014 and 2015.<sup>3</sup> States Parties are also addressing Article VII related issues during the current 2018-2020 Intersessional Programme during the annual Meetings of Experts on Assistance, Preparedness and Response (MX4).

## **Summary of Presentations**

### **Opening remarks and project update**

Mr Daniel Feakes (Chief of the BWC ISU) opened the seminar and welcomed participants. This was followed by brief remarks from Ambassador Nobushige Takamizawa (Permanent Representative of Japan to the Conference on Disarmament). Dr Christina Schori-Liang (Head of Terrorism and Organised Crime, GCSP)

welcomed participants on behalf of GCSP and gave a brief overview of GCSP’s activities.

Dr Alex Lampalzer (Deputy Chief, ISU) was the last speaker of the introductory session. He updated participants on the status of the project on [‘Strengthening National, Sub-Regional, and International Capacities to Prepare for and Respond to the Deliberate Use of Biological Weapons’](#). This project consists of two sub-projects, namely one on ‘Strengthening capacities to prepare for and respond to deliberate use of BWs’ (overseen by the BWC ISU) and the second one is on ‘Improving the UN’s preparedness to investigate allegations of use of CBWs’ (led by the WMD Branch of the Office for Disarmament Affairs in New York).

<sup>2</sup> [Final Document of the Eighth BWC Review Conference \(BWC/CONF.VIII/4\), Part II \(Final Declaration\) Section G, paragraph 39](#)

<sup>3</sup> [BWC/MSP/2018/MX.4/2](#)





*From left: Mr Daniel Feakes (Chief BWC-ISU), Dr Christina Schori-Liang (Head of Terrorism and Organized Crime, GCSP) and Dr Alex Lampalzer (Deputy Chief BWC-ISU) during introductory session*

As regards the sub-project implemented by the ISU, four two-day regional workshops on assistance, response and preparedness related aspects will be held in Asia between June 2019 and March 2020. Three events will focus on the ASEAN region (6-7 June 2019 in Bangkok, Thailand; 1-2 October 2019 in Kuala Lumpur, Malaysia; and early 2020 in Manila, the Philippines). One regional workshop for BWC States Parties in Central Asia will be hosted in Issyk Kul province, Kyrgyz Republic from 26 to 27 June 2019.

Besides these four workshops, four international one-day seminars on Article VII related issues will also be organized in Geneva as part of the sub-project. These seminars are primarily aimed at disarmament diplomats from Permanent Missions in Geneva and representatives of international organizations. The first seminar was held on 20 November 2018 at GCSP, which looked at the 'Importance of Disease Monitoring and Alert Mechanisms: Lessons for the Biological Weapons Convention'.<sup>4</sup> More than fifty participants attended the event.

Regarding this second seminar, Lampalzer expressed the hope that the discussions and any lessons would contribute to the upcoming Meeting of Experts on Assistance, Response and Preparedness (MX4) from 6 to 7 August 2019. In this context, he noted that two of its agenda items (the examination of the concept of bio-medical units; and the exploration of approaches to strengthen international response capabilities for infectious disease outbreaks) were closely linked to the seminar's agenda. As well as the preparation of brief summary reports, he informed participants that four substantive non-papers will be prepared on each of the four seminar topics.

### **Session I: Introduction**

Dr John Walker (Head of the Arms Control and Disarmament Research Unit, Foreign and Commonwealth Office, UK) delivered the first introductory presentation entitled '[Establishing required core operational capabilities for implementation of Article VII](#)'.

<sup>4</sup> [Seminar on The Importance of Disease Surveillance and Alert Mechanisms: Lessons for the BWC](#)

<sup>5</sup> [BWC/MSP/2018/WP.6: Core Elements for an Effective Article VII Response](#)



*Dr John Walker (Head of the Arms Control and Disarmament Research Unit, Foreign and Commonwealth Office, UK) delivering a presentation on Establishing required core operational capabilities for implementation of Article VII/BWC*

He first outlined the reasons for the current interest in, and importance of, Article VII in the context of the 2018-2020 intersessional work programme. Dr Walker noted that there is considerable cross-regional support for progress, not just for operationalising Article VII, but also for strengthening global capacities and capabilities for responding to the deliberate release of biological agents and toxins. He reminded the audience that Article VII has never been invoked and the way it would be done raises several challenging questions about the practicalities and the relationship between anything proposed or provided under Article VII and the likely on-going humanitarian response in the state or states concerned.

Dr Walker stated that an effective, efficient and timely response requires core elements to be in place. A joint UK-Russian Federation working paper presented at the 2018 Meeting of States Parties listed these elements.<sup>5</sup> They fall under three main headings: procedures to initiate and mount a response; the scientific and medical aspects; and the operational and logistical dimension. Dr Walker explained that there is no one single key element, and an integrated

response covering a range of elements is essential as is the need for an overarching command and control structure. He also emphasized sufficient financial resources as an essential prerequisite for any substantive progress on building up and sustaining the core elements needed for an effective international response capability.

Furthermore, Dr Walker informed seminar participants about planned steps on assistance, response and preparedness issues that will be proposed for consideration in MX4. He believed that these will likely be the priorities for many

**THERE IS NO ONE SINGLE KEY ELEMENT - AN INTEGRATED RESPONSE COVERING A RANGE OF ELEMENTS IS ESSENTIAL AS IS THE NEED FOR SOME OVERARCHING COMMAND AND CONTROL STRUCTURE**

**Dr John Walker (Head of the Arms Control and Disarmament Research Unit, Foreign and Commonwealth Office, UK)**



States Parties over the remaining two years of the current intersessional programme.

In his remarks, Mr Vladimir Ladanov (Senior Counsellor, Ministry of Foreign Affairs, Russian Federation) focused on the '[Russian Federation's proposed concept for mobile biomedical units](#)'. He informed the audience about the effectiveness of these units in ensuring a rapid public health response to infectious disease outbreaks. Additionally, he shared some characteristics and benefits of these mobile units, especially for enhancing implementation of Article VII and delivering emergency assistance to a State Party affected by the use of biological weapons. Mr Ladanov suggested that States Parties may agree on assigning their national mobile units to a database maintained by the ISU that may be employed if Article VII is invoked.

In order to enhance preparedness for the effective delivery of assistance and promoting multilateral co-operation, Mr Ladanov proposed that States Parties may also agree on conducting joint training exercises to build interoperability as well as equipment familiarisation while sharing best practices and lessons learned. In his concluding remarks he noted that funding for these activities could come from voluntary contributions

## **Session II: The Deployment of National Rapid Response Units to International Biological Incidents**

Dr Roman Woelfel (Head of Task Force Medical CBRN-Defence of the Bundeswehr Medical Academy, German Armed Forces) introduced the concept of '[Mobile Elements for Outbreak Response](#)' developed at the Bundeswehr's Institute of Microbiology. During his presentation, he described the response team's capacities, which allow forensic sampling and reliable detection of biological warfare agents as well as diagnosis of other dangerous diseases, even under poor logistical circumstances and in remote areas.



*Mr Vladimir Ladanov (Senior Counsellor, Ministry of Foreign Affairs, Russian Federation) delivering his presentation on: Rapid Response Units under the BWC: Benefits and challenges of putting a vision into action*

Dr Woelfel also introduced the concept of the European Mobile Laboratory (EMLab) Project, which has been developed at the Bundeswehr Institute of Microbiology originally as a rapid response element for military biological defence operations. Dr Woelfel concluded his presentation with lessons learned from the deployment of the EMLab, including logistical issues. Training, biosafety and biosecurity issues related to the Bundeswehr's rapid response teams were also addressed by Dr Woelfel.



*Dr Roman Woelfel (Head, Task Force Medical CBRN-Defence, Bundeswehr Medical Academy, Dept. Federal-Medical CBRN) delivering his presentation on Mobile Elements for Outbreak Response: Challenges, Solutions and Lessons-learned*

Dr Zhen Xu (Head, Strategic Planning and Capacity Building, Health Emergency Centre, China Center for Disease Control and Prevention (CDC)) noted at the beginning of her presentation on '[Development and Deployment of China's National Rapid Response Teams: Opportunities and Challenges](#)' that increasing health threats and increasing demands by the citizens have underlined the need for a more operational and deployable taskforce.

Dr Xu explained that the lessons learned from the SARS outbreak and the WenChuan earthquake in China have reiterated the importance and urgency of improving operational capacity for emergencies. Thus, the Chinese Government has shown a strong commitment and invested massive resources in the development of health emergency response systems in the past 15 years. As one of the most important components of the system, the national programme of Rapid Response Teams (RRTs) was officially launched in 2010. A total of over 500 million RMB has been invested to develop self-sufficient, rapidly-deployable mobile teams to respond to health emergencies at national and sub-national levels. As of 2018, 37 national RRTs have been established and fully equipped for the purpose of medical rescue in natural disasters, response to infectious disease outbreaks, chemical poisoning, and radiation events. Among these RRTs, the national emergency medical team in Sichuan province has been verified and classified by the World Health Organization as a Type 3 Emergency Medical Team (EMT)<sup>6</sup>, and another two teams were classified as Type 2 EMTs. She also noted that all provinces, prefectures, and counties have established their own health emergency teams, which serve as the core workforce to deal with health emergencies on-site.



*Dr Zhen XU (Head, Strategic Planning and Capacity Building, Health Emergency Center, China CDC) delivering a presentation on Development and Deployment of China's National Rapid Response Teams: Opportunities and Challenges*

**THE THREATS FROM EMERGING  
INFECTIOUS DISEASES, NATURAL  
DISASTERS, CHEMICAL AGENTS,  
RADIATION EVENTS AND OTHER  
HAZARDS HAVE CONTINUOUSLY  
POSED CHALLENGES TO THE PUBLIC  
HEALTH SYSTEMS OF BWC STATES  
PARTIES**

**Dr Zhen XU (Head, Strategic Planning and  
Capacity Building, Health Emergency Center,  
China CDC**

Among the previous international missions of China's national RRTs, the deployment to West Africa to respond to the Ebola outbreak was the largest in terms of the number of personnel deployed and its duration. She noted that a total of 19 teams of nearly 200 persons from China CDC, National Health Commission, military CDC, and provincial CDCs and hospitals were deployed to West Africa in 2014 and 2015. The deployed RRTs were assigned different field tasks which comprised medical equipment training, BSL-3 laboratory setting up and testing, public health training and demonstration of project

<sup>6</sup> Type 3 EMT is a deployable medical unit to international incidents with referral level care and inpatient facilities with surgery, (100 outpatients and 40 inpatients), Type 2 EMT is a deployable team for national incidents with inpatient facilities with surgery (100 outpatients and 20 inpatients).



implementation upon the identified needs of Ebola affected countries. During her presentation, Dr Xu explained that deployed teams have demonstrated the Chinese Government's commitment and contribution to global emergency response efforts by protecting people's health in both Africa and China, as well as building the required national capacity in China for biological events caused by highly contagious pathogens.

She also reminded the audience that emergency response plans and RRTs' Standard Operating Procedures should be sufficiently flexible and be kept updated, while being continuously exercised by national emergency response practitioners. During her talk, Dr Xu also referred to the importance of a post-operation review, which was conducted by the China CDC in 2015. It brought up successful experiences but also revealed challenges with respect to logistical support in terms of aerial transportation of hazardous biological materials, field accommodation and transportation, sustainability of missions during long-term deployments, and coordination with the local community. In her concluding remarks, Dr Wu noted that these challenges will be prioritized in future training and exercises in order to improve the capacities of RRTs for international deployment.

### **Session III: Rapid Response Capacities available at the International Level**

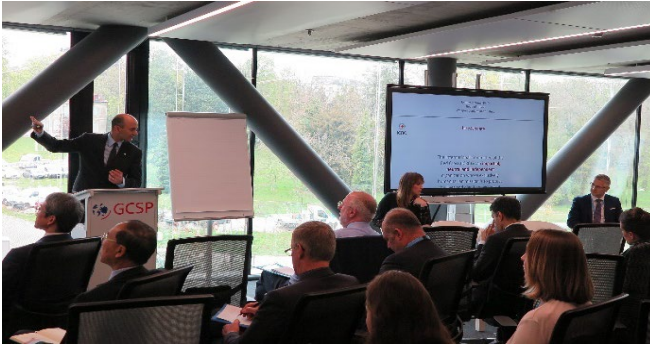
Dr Maria Romano (Emergency Management Centre for Animal Health, Food and Agriculture Organization of the United Nations) kicked off Session III with a presentation [about 'Insight into Food and Agriculture Organization of the United Nations \(FAO\) methods during animal health emergencies'](#).



*Dr Maria Romano from the Emergency Management Centre for Animal Health, Food and Agriculture Organization of the United Nations delivering her presentation on Insight into FAO's methods during animal health emergencies*

Dr Romano briefed seminar participants about the activities of the Emergency Management Centre for Animal Health (EMC-AH). The EMC-AH is the leading global centre of animal health emergency management and provides the platform, tools, support, and coordination to enhance country, regional and international preparedness and response capacity. The EMC-AH also addresses the requirements needed to improve prevention, detection, and recovery actions. Upon explaining the emergency management cycle, Dr Romano described the actions that are taken during an emergency response operation to reduce damage to livelihoods, human and animal health and animal production systems in a coordinated manner - including One Health coordination as appropriate.

Dr Romano also presented the steps taken by the EMC-AH during an animal health emergency. These include gathering field intelligence from the affected region, identifying the region's immediate needs, securing the appropriate experts and mobilizing the necessary resources to address the needs of the state. Dr Romano concluded her presentation by highlighting the efforts of the EMC-AH to develop short, medium, and long-term action plans in close collaboration with national counterparts.



*Dr Johnny Nehmé, Head of CBRN Sector, International Committee of the Red Cross delivering his presentation on ICRC deployment in response to a disease outbreak occurring in an active armed conflict context. Case-study of the ongoing Ebola outbreak in DRC*

Dr Johnny Nehmé (Head of CBRN Sector, International Committee of the Red Cross:) started his presentation on ['ICRC deployment in response to a disease outbreak occurring in an active armed conflict context. Case Study of the ongoing Ebola outbreak in DRC'](#) with recalling the ICRC's mandate as an impartial, neutral and independent organization. He then described the ICRC's competency-based approach to establishing rapidly deployable teams, which includes defined competency standards and related training programmes, standardized equipment and relevant guidelines and Standard Operating Procedures. Dr Nehmé explained the ICRC's operational response mechanism by describing the various stages such as the trigger for a response mission, the assessment of an assistance request or an alert, the activation of a response team and its deployment. He also informed participants about the importance of the post-mission phase for identifying lessons and adjusting/streamlining processes for future operations.

Dr Nehmé also noted the most important lessons learned from the ICRC's previous operations: close coordination with other players present in the field, open communications, adoption of a risk management approach, as well deployment of multi-disciplinary and competency-based teams. Dr Nehmé concluded his presentation by sharing some of the most crucial challenges during a response operation (e.g. taking a decision whether to refrain or engaging in an alleged use event, gaining access to the site,

identifying the outbreak origin as natural or deliberate, political and security implications for the organization due to the information collected around a possible deliberate bio incident).

#### **Session IV: Interoperability, Training, Standards, and Certification**

Mr Christophe Schmachtel (Technical Officer, Emergency Medical Teams Secretariat, Emergency Operations, WHO Health Emergencies Programme) presented the ['WHO Emergency Medical Team Initiative: Surge Capacity in Health Care During Emergencies'](#). At the beginning of his presentation, he informed participants about the EMT's reaction time for deployment to different natural disasters and put it in comparison to medical capabilities required.

**INTERNATIONAL EMERGENCY MEDICAL TEAMS WILL BE MORE EFFECTIVE WHEN THEIR ACTIVITIES ARE INTEGRATED IN A COORDINATED RESPONSE UNDER THE NATIONAL HEALTH EMERGENCY MANAGEMENT AUTHORITIES AND COLLABORATION WITH NATIONAL HEALTH SYSTEM AND OTHER INTERNATIONAL PLAYERS IN THE FIELD**

**Mr Christophe Schmachtel (Technical Officer, Emergency Medical Teams Secretariat, Emergency Operations, WHO Health Emergencies Programme)**

After recalling the strategic objectives of EMTs, Mr Schmachtel referred to the EMT guiding principles, core standards, and technical standards. Mr Schmachtel emphasized some important components of the EMT's guiding principles: providing safe, timely, effective, efficient, equitable and patient-centred care; adopting a human rights-based approach to their response; treating patients in a medically ethical manner; being accountable to the patients, host government, own organisation and donors; and commitment to be integrated in a coordinated response under the national health emergency management authorities.

Mr Schmachtel then described the technical standards of the EMTs. Among the most important are registration, coordination and regular reporting to the national health system, self-sufficiency, adherence to professional guidelines and criteria for treatment, adherence to international quality standards for donation of medicines, malpractice insurance, and bio-waste management. Mr Schmachtel also informed seminar participants in detail about activation and coordination aspects for EMTs, the key steps in the EMT deployment process, leadership of EMTs and tools used for coordination such as registration and reporting forms including arrival and exit reports. Mr Schmachtel concluded his presentation by reiterating key benefits of the EMT initiative for people and States Parties.



*Dr Erika Wichro (International Consultant, Humanitarian Emergencies and Global Health) delivering her presentation on The European Civil Protection Mechanism from a Practitioner's Perspective*

Dr Erika Wichro (International Consultant, Humanitarian Emergencies and Global Health) focused on her diverse and long experience as a medical doctor, and her participation in many medical and humanitarian missions around the globe.

At the outset of her presentation on ['The European Civil Protection Mechanism from a Practitioner's Perspective'](#), Dr Wichro provided a brief overview of the European Civil Protection Mechanism (EUCPM), its technical capacity with a focus on the medical assets including the European Medical Corps (EMC), the strategies for further strengthening and improving the mechanism, the benefits and challenges from a

practitioner's perspective and potential opportunities for collaboration.

Dr Wichro explained that the EUCPM was set up to enable coordinated assistance from its participating States to victims of natural and man-made disasters inside and outside the EU. The EUCPM comprises the European Commission, the 28 EU Member States plus six participating States. The EUCPM covers prevention, preparedness and response, and provides support upon request from an affected country inside or outside the EU. The request for assistance from the affected country government/authority, UN agencies (e.g. UNOCHA, WHO, others), IOM and IFRC results in support comprised of voluntary contributions of in-kind assistance, specialized teams, modules such as medical capacity, experts and equipment. Dr Wichro also highlighted that the added value of the EUCPM is a well-coordinated, effective and efficient response as a result of pooling the resources of the EU Member States. The EUCPM has been activated 126 times between 2002 and 2018. Most of the activations are related to forest fires, floods, environmental accidents and population displacements. Severe weather conditions, earthquakes, medical emergencies, disaster preparedness missions and consular support have also been part of the EUCPM activation cases.

Dr Wichro further noted that the quality of the assistance delivered is ensured through the establishment of a quality assurance and certification process to meet similar standards for international deployments.

Dr Wichro then briefed seminar participants on the European Medical Corps, which is a part of the pool that focuses on medical response capacities, such as medical evacuation, mobile laboratories or emergency medical teams. She also informed the audience about another strategy to improve the mechanism, namely the civil protection scheme rescEU, which supports participating States to share their national prevention and preparedness strategies with a view to identifying and addressing potential gaps in disaster response. The scheme complements



the national response capacities and finances adaptation, repair, transport and operational costs.

At the end of her presentation, Dr Wichro described the EUCPM training programme and the exchange of experts' system among the participating States as an opportunity for professional growth and experience exchange among the technical experts. Finally, she drew attention to the EUCPM Knowledge Network and relevant projects implemented by the Joint Research Centre.

Royal Thai Army Chemical Department Bangkok, Thailand) and Mr. Usman Iqbal Jadoon, (Counsellor; Permanent Mission of Pakistan to the UN and other international organizations and Chair of the 2019 BWC Meeting of Experts on Assistance, Preparedness and Response). Mr Daniel Feakes (Chief, BWC ISU) moderated the discussion.

During the discussion, the panellists explored the status quo, challenges and implications with respect to the operationalization of Article VII. Ambassador Hwang noted the current lack in



the operationalization of the provisions, but also

*From left: Lieutenant General (Ret.) MC Chalernsuk Yugala (Advisor, Royal Thai Army Chemical Department), Ambassador Yann Hwang (Permanent Representative of France to the Conference on Disarmament; Chair of the 2019 BWC Meeting of States Parties), Mr Usman Iqbal Jadoon, (Counsellor; Permanent Mission of Pakistan to the UN and other international organizations; Chair of the 2019 Meeting of Experts on Assistance, Preparedness and Response), and Mr Daniel Feakes (Chief, BWC-ISU)*

## Session V: Panel Discussion

The series of presentations was followed by a panel discussion, in which the panellists shared views on core elements and implications for an effective response under Article VII. The panel was composed of Ambassador Yann Hwang (Permanent Representative of France to the Conference on Disarmament and Chair of the 2019 BWC Meeting of States Parties), Lieutenant General (Ret.) MC Chalernsuk Yugala (Advisor,

commented positively on the various efforts and initiatives by a number of States Parties during the current intersessional programme. Furthermore, he stressed the collective responsibility of States Parties to implement the provisions of Article VII and also emphasized that providing assistance is an obligation in line with the Convention's provisions.

General Yugala noted the need for building capacity under the BWC and suggested

establishing a team under the BWC in order to be able to respond to a request effectively and efficiently as in other international organizations. Furthermore, he stressed the importance of capacity building at the national and regional levels to achieve the operationalization of Article VII.

Mr Jadoon emphasized the need to build on the discussions at the 2018 Meeting of Experts on Assistance, Response and Preparedness in order to have a cumulative input into this year's Meeting of Experts. He suggested focusing on concrete deliverables such as procedures for the submission of a request under Article VII, the operationalization of the Article VII database and advancing discussions on the concept of biomedical units. Furthermore, he noted the usefulness of conducting exercises on practical coordination issues. Additionally, he stressed the important linkage between Articles VII and X and noted that building national capacities in developing countries could in turn also contribute to enhancing preparedness, response and assistance related capacities.

Overall, the panellists noted a large degree of convergence among States Parties' positions on

**THE SEMINAR ACKNOWLEDGED THAT NATIONAL AND INTERNATIONAL RAPID RESPONSE MECHANISMS AND CAPACITIES COULD HELP TO PROTECT NOT ONLY AGAINST NATURAL DISEASE OUTBREAKS, BUT ALSO CAN BE MOBILISED TO RESPOND TO USE OF BIOLOGICAL AND TOXIN WEAPONS**

Article VII and also positively acknowledged the wide cross-regional support for the proposals discussed in the current 2018-2020 intersessional programme.

## **Summary and Conclusions**

Rapid response teams represent an integral element of bio-preparedness and response considerations of states as well as regional and international organizations. The capability to deploy assets quickly for providing assistance in response to a public or animal health or pest control event has become increasingly important for many national agencies, non-governmental organizations as well as international organizations.

The rapid deployment of such capacities is based on a request for assistance by the affected State. The type of support provided may differ in each scenario and range from e.g. (risk) assessment related activities, the provision of emergency supplies of medicines and vaccines, taking of bio-samples including analysis, investigative activities, diagnosis, medical treatment and support, or providing support to the overall coordination of emergency response process.

The seminar highlighted the various stages of the incident response process life cycle. Elements include, inter alia, information monitoring, activation, information gathering, mission preparation, deployment, operation, mission termination, re-deployment, and post mission analysis and follow up actions.

Several states have created national response capacities within both civilian and/or military formations. Discussions at the seminar clearly highlighted the benefits of establishing rapid response teams both for domestic and international response missions. Furthermore, experience from past international deployments clearly demonstrated the added value of such capabilities for supporting and augmenting national capabilities that might be limited or overwhelmed with the magnitude of the disaster.

Discussions at the seminar underlined the dual benefit of such units. Not only could they help in case of natural disease outbreaks, but they could also provide assistance in response to deliberate use scenarios. In this regard, many speakers acknowledged the potential difficulty in

distinguishing between natural and deliberate outbreaks at an early stage. At the same time, speakers emphasized that one of the most effective methods to prepare for deliberate use scenarios is strengthening existing national public health capacities for tackling natural disease outbreaks. Concerning this, some speakers emphasized the linkage between Article VII and Article X and highlighted the importance of international assistance and cooperation for capacity building purposes.

The seminar also highlighted that establishing and maintaining rapid response capacities requires sustained funding. Past international emergency response operations have shown that such investments into strengthening national rapid response capacities - before a crisis occurs - are well justified.

Seminar discussions also addressed the aspect of operationalizing Article VII. Overall, speakers positively acknowledged the increasing degree of convergence and cross-regional support among States Parties for current Article VII related initiatives. At the same time, however, participants also noted that decisions are often inter-related and therefore discussions on other topics also need to be taken into account.



**ANNEX A**  
**International Seminar:**  
**Rapid International Response to Biological Incidents: Lessons for the BWC**

**Seminar Agenda**

Time	Item	Presenter
09.30 - 09.45	<b>Welcome Remarks</b>	<b>Mr Daniel Feakes</b> Chief, BWC ISU <b>Ambassador Nobushige Takamizawa</b> Ambassador Extraordinary and Plenipotentiary, Delegation of Japan to the Conference on Disarmament <b>Dr Christina Schori-Liang</b> Head of Terrorism and Organised Crime, GCSP
09.45 - 10.00	<b>Update of Project</b> on “Strengthening National, Sub-Regional and International Capacities to Prepare for and Respond to Deliberate Use of Biological Weapons”	<b>Dr Alex Lampalzer</b> Deputy Chief, BWC ISU
10.00 - 11.00	<b>Session I: Introduction</b> <ul style="list-style-type: none"> <li>Establishing required core operational capabilities for implementation of Article VII/BWC</li> <li>Rapid Response Units under the BWC: Benefits and challenges of putting a vision into action</li> </ul>	<b>Dr John R. Walker</b> Head of the Arms Control and Disarmament Research Unit, Foreign and Commonwealth Office, UK <b>Mr Vladimir Ladanov</b> Senior Counsellor, Ministry of Foreign Affairs, Russian Federation
11.00 - 11.20	<b>Coffee Break</b>	
11.20 - 12.30	<b>Session II: The Deployment of National Rapid Response Units to International Biological Incidents</b>	

Time	Item	Presenter
	<ul style="list-style-type: none"> <li>Mobile Elements for Outbreak Response: Challenges, Solutions and Lessons-learned</li> <li>Development and Deployment of China's National Rapid Response Teams: Opportunities and Challenges</li> </ul>	<p><b>Dr Roman Woelfel</b>, Head, Task Force Medical CBRN-Defence, Bundeswehr Medical Academy, Dept. Federal-Medical CBRN Defence</p> <p><b>Dr Zhen XU</b> Head, Strategic Planning and Capacity Building, Health Emergency Center, China CDC</p>
<b>12.30 - 13.30</b>	<b>Lunch</b>	
<b>13.30 - 14.40</b>	<p><b>Session III: Rapid Response Capacities available at the International Level</b></p> <ul style="list-style-type: none"> <li>Insight into FAO's methods during animal health emergencies</li> <li>ICRC deployment in response to a disease outbreak occurring in an active armed conflict context. Case Study of the ongoing Ebola outbreak in DRC</li> </ul>	<p><b>Dr Maria Romano</b> Emergency Management Centre for Animal Health, Food and Agriculture Organization of the United Nations</p> <p><b>Dr Johnny Nehmé</b> Head of CBRN Sector, International Committee of the Red Cross</p>
<b>14.40-15.15</b>	<p><b>Session IV: Interoperability, Training, Standards, and Certification</b></p> <ul style="list-style-type: none"> <li>WHO Emergency Medical Team Initiative: Surge Capacity in Health Care During Emergencies</li> <li>The European Civil Protection Mechanism from a Practitioner's Perspective</li> </ul>	<p><b>Mr Christophe Schmachtel</b> Technical Officer, Emergency Medical Teams Secretariat, Emergency Operations, WHO Health Emergencies Programme</p> <p><b>Dr. Erika Wichro, MD, MA, MPH;</b> International Consultant - Humanitarian Emergencies &amp; Global Health</p>
<b>15.15-15.35</b>	<b>Coffee Break</b>	

Time	Item	Presenter
15.35-16.15	<p><b>Session V: Panel Discussion</b></p> <p>Panellists will share their views on core elements and implications required for an effective response under Article VII. A number of lessons and follow-up issues with respect to the operationalization of Article VII, particularly on rapid response teams will be explored.</p>	<p><b>Panellists:</b></p> <p><b>Ambassador Yann Hwang</b>, Permanent Representative of France to the Conference on Disarmament; Chair of the 2019 BWC Meeting of States Parties</p> <p><b>Lieutenant General (Ret.) MC Chalernsuk Yugala</b> Advisor, Royal Thai Army Chemical Department Bangkok, Thailand</p> <p><b>Mr. Usman Iqbal Jadoon</b>, Counsellor; Permanent Mission of Pakistan to the UN and other international organizations; Chair of the 2019 Meeting of Experts on Assistance, Preparedness and Response</p> <p><b>Moderator: Mr Daniel Feakes</b> Chief, BWC ISU</p>
16.15-16.30	<b>Wrap up and Closing Remarks (BWC ISU)</b>	



## ANNEX B

### Speakers' Biographies

#### **H.E. Ambassador Nobushige Takamizawa**

##### **Ambassador Extraordinary and Plenipotentiary, Delegation of Japan to the Conference on Disarmament**

Mr. Nobushige Takamizawa has been Ambassador and Permanent Representative of Japan to the Conference on Disarmament in Geneva since December 2016.

Prior to his current assignment, since July 2013, Mr. Takamizawa served as Assistant Chief Cabinet Secretary in the cabinet secretariat and was in charge of national security, crisis management and cyber security.

Mr. Takamizawa has held various positions in the Ministry of Defense of Japan, including positions as President of the National Institute for Defense Studies (NIDS) from 2011 to 2013, Director General of the Bureau of Defense Policy from 2008 to 2011, and Director General of the Bureau of Operational Policy from 2007 to 2008.

#### **Dr Christina Schori Liang**

##### **Head of Terrorism and Organised Crime, Geneva Centre for Security Policy (GCSP)**

Christina Schori Liang is a Senior Advisor and Senior Fellow at the Geneva Centre for Security Policy (GCSP). She leads the Terrorism and Organised Crime Cluster at the GCSP. She designs and directs courses on Preventing Violent Extremism and on the Protection of Civilians in Armed Conflict: Addressing the Challenges Posed by the Presence of Non-State Armed Groups and contributes to GCSP's Track Two diplomacy and dialogue events. From 2012-2016, she served as Co-Director and later as Director of GCSP's New Issues in Security Course. Dr Liang was editor of Europe for the Europeans: The Foreign and Security Policy of the Populist Radical Right and has contributed to the 2015, 2016 and 2017 Global Terrorism Index Reports. She has given academic and policy-related presentations in over 25 countries. She is an active member of the UN's Global Counter Terrorism Research Network and advises the UN Security Council's 1267 Committee on terrorist financing. She has testified for the US National Intelligence Council, the US State Department, the European Commission, and the European Forum for Urban Security and has given multiple presentations for the NATO Defence College in Rome and the OSCE Secretariat in Vienna. Dr Liang is a Steering Group Member of the RESOLVE Network, a member of the Global Solutions Exchange (GSX), and a global expert for the Global Initiative Against Transnational Organized Crime. She was an Adjunct Faculty member for Boston University from 2008-2013 and is currently a Professor at the Paris School of International Affairs, Sciences Po, Paris. She holds a doctorate in International Relations and an MA in History and International Politics from the Graduate Institute of International and Development Studies, Geneva, Switzerland.

## **Mr Daniel Feakes**

### **Chief, Implementation Support Unit of the Biological Weapons Convention**

Daniel Feakes is the Chief of the Implementation Support Unit (ISU) of the Biological Weapons Convention within the United Nations Office for Disarmament Affairs in Geneva. He manages the activities of the ISU and the implementation of an EU Council Decision in support of the BWC. He was also the Secretary-General of the Eighth BWC Review Conference in November 2016.

Daniel has experience both in the field of multilateral disarmament and in working with international organisations. Until November 2014 he was the Strategy and Policy Adviser in the Technical Secretariat of the Organisation for the Prohibition of Chemical Weapons (OPCW) in The Hague. From 2009 to 2013 he was a Senior Policy Officer in the OPCW's Verification Division. At the OPCW, Daniel oversaw education and outreach activities, was involved in the preparation and conduct of the Third Review Conference of the Chemical Weapons Convention and worked closely with partners in other international organizations, the scientific community and civil society.

Prior to joining the OPCW in 2009, Daniel spent 12 years as a Research Fellow with the Harvard Sussex Program on Chemical and Biological Weapons where he worked on chemical and biological weapons issues and published widely on these topics.

## **Dr Alex Lampalzer**

### **Deputy Chief, Implementation Support Unit of the Biological Weapons Convention**

Alex Lampalzer graduated in 1992 from the Austrian Military Academy as a NBC Defence Officer. He also holds a PhD in political sciences from the university of Vienna and a MSc in International Project Management. Besides various postings in the Austrian Army, he gained twenty years of experience in international arms control. His first-hand verification expertise stems from working as a chemical weapons inspector with the United Nations Special Commission (UNSCOM) in Iraq and later within the Technical Secretariat of the Organisation for the Prohibition of Chemical Weapons (TS/OPCW). Subsequently, he served as a Senior Policy Officer in the OPCW as well as a Policy Planning Officer in the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO).

Mr Lampalzer represented the OPCW in 2007 in the update of the UN Secretary-General Mechanism and was also a member of the Temporary Working Group on Verification/Scientific Advisory Board established under the auspices of the OPCW Director-General between 2013 and 2015. In 2013, he led a team of 40 international inspectors in one of the CTBTO's largest On-Site Inspection field exercises in Hungary. Alex joined the BWC Implementation Support Unit in January 2016.

## **Dr John Walker**

### **Head of the Foreign and Commonwealth Office's Arms Control and Disarmament Research Unit (ACDRU)**

Dr Walker joined ACDRU in March 1985. He currently focuses on Chemical Weapons Convention (CWC), Comprehensive Nuclear Test Ban Treaty (CTBT), Biological and Toxin Weapons Convention (BWC) issues, the UN Secretary-General's Mechanism, UK nuclear weapons history, and arms control verification, including nuclear disarmament

verification. He currently serves as co Task Leader for the OSI Operational Manual in the CTBTO's Working Group B.

He was a member of the UK delegation at six of the eight BTWC Review Conferences, all four CWC Review Conferences held to date, Working Group B Expert Group meetings during the CWC's Preparatory Commission, VEREX, the BTWC Special Conference 1994, the Ad Hoc Group 1995-2001, and at most BTWC intersessional meetings 2003-present. Dr Walker has published two books: *British Nuclear Weapons and the Test Ban 1954-1973*, Ashgate in 2010; and *Britain and Disarmament: The UK and Nuclear, Biological and Chemical Weapons Arms Control and Programmes 1956-1975* Ashgate, 2012.

### **Mr Vladimir Ladanov**

#### **Head of Section for the South Pacific States, Ministry for Foreign Affairs of Russian Federation**

Mr Vladimir Ladanov is a member of the Russian delegation to the BWC meetings in Geneva and is currently head of section for the South Pacific States at the Ministry for Foreign Affairs of Russia. Vladimir has been dealing with biological arms control since 2006 including policy advice on the BWC, the Geneva Protocol of 1925, the UNSG's mechanism to investigate alleged use, and related issues.

He was a participant at the BWC's three Review Conferences and several intersessional meetings. From 2009 to 2013 he was posted to The Hague at the Russian delegation to the OPCW where he took part in the CWC's Review Conference in 2013. Afterwards he was seconded for four months to the Russian Embassy in Damascus to follow Syria's chemical demilitarization dossier. Vladimir joined the Diplomatic Service in 1998 and served in several geographical departments of the Foreign Ministry and was posted to India from 1999 to 2004.

### **Colonel Roman Wölfel**

#### **Head, Task Force Medical CBRN-Defence, Bundeswehr Medical Academy, Dept. Federal Medical CBRN Defence, Germany**

Dr Woelfel has over 25 years of experience as a medical officer working in the field of CBRN defence. He is a Consultant Clinical Microbiologist and Virologist and Emergency physician. Until September 2014, Dr Woelfel led the Department for Med. Bio-Reconnaissance & Verification at the Bundeswehr Institute of Microbiology. He developed mobile microbiological field laboratories and deployed them to several countries in Europe, Asia and Africa. In 2012 Dr Woelfel became a co-founder of the European Mobile lab project, an EU-funded activity that deployed more than 100 lab scientists to support the 2014-2015 Ebola outbreak support missions in West Africa.

Since 2016 Dr Woelfel is working as Deputy Commissioner for Medical CBRN Defence of the Bundeswehr Surgeon General and leader of the Bundeswehr Medical CBRN Task Force. In his current position, he is responsible for worldwide Medical CBRN defence operations planning and command. His interest in CBRN medical response is based on a mix of operational and academic study crossing both military and civilian health sectors and includes infectious diseases, bio-forensics, emergency response and medical education.



### **Dr Zhen Xu**

#### **Head, Strategic Planning and Capacity Building, Health Emergency Center, China CDC**

Dr Zhen XU is the Head of Branch for Strategic Planning and Capacity Building in the Health Emergency Center of Chinese Center for Disease Control and Prevention (China CDC). Her current responsibilities include supporting the national public health emergency preparedness planning, developing, monitoring and evaluation of core capacities at national and sub-national level public health institutions in responding to public health emergencies, and global health security relevant issues. She is also the Secretary-General and permanent member of Health Emergency Advisory Group under Chinese Preventive Medicine Association, and a member of WHO Health & Security Interface Technical Advisory Group (HIS-TAG).

Dr Xu is an epidemiologist specializing in infectious disease surveillance and control, and an event manager for public health emergencies from infectious and natural disaster hazards. She had been involved in major events responses in China such as SARS, Avian Influenza A (H5N1), pandemic influenza H1N1, Sichuan earthquake etc... as a role of emergency operation coordinator. From 2007 to 2012, she led the Branch for Zoonotic Diseases, the Branch for Respiratory Diseases, and the Branch of Emergency Coordination in the Division of Disease Control and Emergency Response successively. Dr Xu also worked in the World Health Organization (WHO) Regional Office for the Western Pacific in Manila and WHO Headquarter Office in Geneva during 2012-2015 as a technical staff or a consultant in the areas of emerging diseases control, simulation exercises, emergency operations and International Health Regulations (2005) implementation, monitoring and evaluation.

### **Dr Maria Romano**

#### **Emergency Management Specialist, Emergency Management Centre for Animal Health, Food and Agriculture Organization of the United Nations**

Dr Maria Romano is from the United States of America. She previously resided in Alexandria, VA before moving to Rome, Italy in 2018. She serves as an emergency management specialist for the FAO Emergency Management Centre for Animal Health (EMC-AH). Prior to joining the EMC-AH, she was a Veterinary Medical Officer for the U.S. Department of Agriculture in Riverdale, Maryland. She specializes in interagency coordination, public-private partnerships, global health, and emergency management. She has extensive experience in emergency response and incident management. She is also trained as a Public Information Officer with a keen interest in risk communication.

### **Dr Johnny Nehme**

#### **Head, CBRN Sector, International Committee of the Red Cross**

Johnny Nehmé graduated with a PhD in biomedical science in 2005 from the University of Paris, and worked for several years at the French atomic energy commission studying the effects of ionizing radiation on the hematopoietic stem cells. After working as scientific researcher for seven years, he joined the International Committee of the Red Cross (ICRC) where he is assigned as the Head of the Chemical, biological, radiological,

and nuclear (CBRN) sector. He supported the ICRC in developing an operational response to CBRN events, based on a risk management approach, and he is currently coordinating a team of more than 20 experts based all-round the planet performing hazard identification, and risk assessments allowing the ICRC to propose and design preventive measures and response activities.

#### **Mr Christophe Schmachtel**

##### **Technical Officer, Emergency Medical Teams Secretariat, Emergency Operations, WHO Health Emergencies Programme**

Christophe has been a Technical Officer (governance and partnerships) in the Emergency Medical Team (EMT Secretariat) of WHO's Health Emergency Programme since May 2017, focusing on supporting regions and countries in implementing the guiding principles and minimum standards for Emergency Medical Teams as well as the EMT coordination methodology.

Prior to WHO, Christophe was with the UN Office for the Coordination of Humanitarian Affairs (OCHA) for 12 years in different functions, most notably as focal point in charge of managing and deploying the United Nations Disaster Assessment and Coordination (UNDAC) team and acted as the Secretariat of the International Search and Rescue Advisory Group (INSARAG) in the Americas region. He was in charge of emergency deployments of UNDAC teams, led and organized emergency response exercises, trainings, and capacity building workshops with Governments and humanitarian partners, and deployed on several emergency and capacity assessment missions. Mr Schmachtel is a German national who speaks French and English. He holds a Master degree in Public International Law (Paris II, France) as well as in public law and languages (English/German) (Grenoble, France – Canterbury, UK).

#### **Dr Erika Wichro**

##### **International Consultant, Humanitarian Emergencies & Global Health**

Dr Erika Wichro is an Austrian Medical Doctor, Public Health Expert and Humanitarian Emergency & Development (SDGs) Consultant with more than 15 years of national and international clinical, medical and public health work experience in several programs of different countries such as Afghanistan, Pakistan, Turkey for Syria, Ghana, Sierra Leone, Solomon Islands, Zambia and Austria for WHO and other organizations. Her capacities include mastery in cultural sensitivity, complex problem-solving, rapid response, leadership, capacity building, project and program management, technical support in various field such as negotiation, surveillance, epidemiology, risk assessment, outbreak investigation and rapid management, review, assessment, mitigation, diplomacy, monitoring, evaluation, strategic planning, pre-clinical to clinical medical and research. Apart from her capacity building during missions, she taught medical ethics to medical students during her time as researcher at the Medical University Graz, and currently supports the High-Level Coordination and the Course on Negotiation and Decision-Making as trainer. She also served as a consultant and member of the Independent Review Committee for GAVI in 2013, is a member of several EUPHA sections and part of the trained expert pool of the European Union Civil Protection mechanism. Dr Wichro participated as independent

observer in the Cyber-Challenge in Geneva in April 2018 and in the recent EU large-scale exercise Adriatic 2018 in Split in June 2018. She was part of the joint UNDAC/UCP Ebola mission in Ghana in late 2014 and served as UCP member in the Romania large-scale Modex in October 2018. Her latest publication was on the psychosocial care needs in Syria in the August 2018 edition of the Crisis Response Journal.

Dr Wichro's passion is to linking academics, policy-making, management and field operations to strengthening communities' multi-disciplinary capabilities and resilience.

#### **H.E. Ambassador Yann Hwang**

##### **Permanent Representative of France to the Conference on Disarmament; Chair of the 2019 BWC Meeting of States Parties**

Yann Hwang was born in 1967 in Grenoble. He joined the French Foreign Service in 1991 after being graduated from the Institute for Political Sciences of Grenoble and the Regional Institute for Administration of Lyon. At the Quai d'Orsay, he first developed an expertise in Southern Africa where he was later posted twice (South Africa as first Secretary at the French Embassy in charge of domestic affairs and in Namibia as deputy head of the French Embassy). He was given the opportunity to serve during two years as protocol officer for the Former French President Jacques Chirac.

He enlarged his skills and became an expert in security and arms control issues: first in Geneva where he was French negotiator during four years in various disarmament for related to conventional, nuclear and biological weapons; second in Vienna where he was recently posted during four years dealing with politico - military issues and crisis management related issues at the French Permanent Mission to the Organization for Security and Cooperation in Europe. He also has a professional experience in aerospace and defense industry as responsible for institutional relations for Safran Holding Company.

From September 2015 to August 2018 he was the Head of Division for Arms control and the OSCE at the French MFA. Since September 2018, he is the Permanent Representative of France to the Conference on Disarmament in Geneva.

#### **Lieutenant General (Ret.) MC Chalermasuk Yugala**

##### **Advisor, Royal Thai Army Chemical Department Bangkok, Thailand**

Dr Yugala is a retired army officer from Thailand with the rank of Lieutenant General before retirement. He worked at Royal Thai Army Chemical Department in the field of CBRN during 35 years of active service; his last executive position was Deputy Director General, appointed Senior Army Expert (CBRN) a few years before retirement and appointed Advisor to the Royal Thai Army Chemical Department after retirement to the present.

He graduated in 1976 with a degree in Biological Sciences from Macquarie University, Australia. Further study/training in field of CBRN at institutions /agencies, both military and civilian, inter alia: RTA Chemical School, US Army Chemical School, OPCW, UNMOVIC, UNODA and the Australian Nuclear Science and Technology Organisation.

Dr Yugala worked as instructor /trainer, UN chemical Weapons Inspector in Iraq, member of Thai Delegation to the CWC and BWC conferences, Chairman of BWC Committee, Chair

of NSC's Working Groups on biological and chemical Threats. He also assisted civilian agencies (including Ministries of Health and Interior, NSC) in the field of CBR disaster/crisis response and management.

#### **Mr Usman Jadoon**

#### **Counsellor; Permanent Mission of Pakistan to the UN and other international organizations; Chair of the 2019 Meeting of Experts on Assistance, Preparedness and Response**

Usman Jadoon is a career diplomat who joined the Foreign Service of Pakistan in 2003. Since September 2013, he is serving as a Counsellor in Pakistan's Permanent Mission in Geneva, in-charge of disarmament issues. From 2011-2013, he was posted as the Director of Arms Control and Disarmament at Pakistan's Foreign Ministry in Islamabad. He earlier served in Pakistan's Permanent Mission in Vienna, from 2006-2011, covering the IAEA.

He was part of the negotiations on the Arms Trade Treaty and also remained closely associated with the Nuclear Security Summit process including as Pakistan's Sous-Sherpa. He has served on three UN Groups of Governmental Experts: on Nuclear Disarmament Verification; Prevention of an Arms Race in Outer Space; and Military Expenditures.

He holds a Masters degree in International Relations from University of Leicester UK and is a graduate of Foreign Service Academy Islamabad and the Clingendael Institute in The Hague. He has also completed a one-year Spanish language course at the University of Salamanca in Spain. He co-authored a chapter on fissile materials in a book on Nuclear Non-Proliferation in International Law published by the TMC Asser Press/Springer in 2016.