



## Project Report

# Informing Policymakers of the Progress in Strengthening the Chemical and Biological Weapons Non-Proliferation Regime<sup>1</sup>

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## Summary

There is a longstanding norm against the development and use of chemical and biological weapons, which is embodied in two global prohibition regimes. Review of the efficiency and of the effectiveness of these regimes needs to be considered in the light of the changing scientific, technological and political context.. In this report we discuss a project which has sought to contribute to a review of these regimes through engagement with UK parliamentarians and the general public.

This summary report of the project contains the following 5 sections. Section 1 is the background introduction, Section 2 gives a brief overview of a research report and its distribution, section 3 then deals with two new methods we used to publicise the report: our webinar and the cartoons which we produced to enhance the spread and understanding of the report. Then section 4 gives a review of the feedback we received about the report and the final section 5 contains our reflections on the project as a whole.

## 1 Introduction

There is a strong tradition of civil society interest in strengthening the Chemical and Biological Weapons Disarmament and Non-Proliferation Regimes. Input to State and Inter-State discussions have been and is being provided by many Non-State groups including such well known organisations such as the International Committee of the Red Cross and the Pugwash group of scientists. Moreover, very different methods have been used by different groups at different times in critical but constructive engagement between civil society and policy-makers on efforts to strengthen both regimes<sup>1</sup>.

In 2020, we started a series of projects on “*Strengthening the Biological and Chemical Weapons Conventions*”. This project titled “*Informing Policymakers of the Progress in Strengthening the Chemical and Biological Weapons Non-Proliferation Regime*” is one of the projects. This project was selected by London Metropolitan University for funding via the UK Research and Innovation (UKRI) Strategic Priorities Fund.

This project fits within that diverse tradition of civil society efforts to strengthen the norm against chemical and biological weapons and aimed to provide the UK Parliament and general public with a concise report on the present state of these regimes and the options for strengthening them after the pandemic in the run up to the 2022 9th Review Conference of the Biological and Toxin Weapons Convention (BTWC) and the 2023 5th Review Conference of the Chemical Weapons Convention (CWC). This project also aimed to explore new informative and simple ways to disseminate our research and build up closer connections for further engagement with policymakers.

The project was carried out between November 2020 and March 2021 with 4 stages: Stage 1: to write and present a report on current CWC and BTWC issues to the UK Parliament in late January 2021; Stage 2: to disseminate this information about biological security to the general public through the media, for example via a webinar and educational video at the end of January 2021. Stage 3 was to collect feedback from the UK Parliament by the end of Feb/Middle of March 2021 and Stage 4 to write a project report at the end of March 2021.

The impact of this project is documented by a report to UK Parliament, education videos on the report and webinar, a series of cartoons, and interviews and feedbacks from general public and the parliamentarians. This project is also directly linked to our three other projects: 1) *Strengthening Biological Security after COVID-19: A Review of Proposals that could be agreed*

*at the 2021 9th Review Conference of the Biological and Toxin Weapons Convention (BTWC) with a Focus on Codes of Conduct and Biological Security Education for Life Scientists, funded by London Metropolitan University Rescaling Fund; 2) A Civil Society Input to the 2021 9th Review Conference of the Biological and Toxin Weapons Convention (BTWC), funded by the Joseph Rowntree grant application; and 3) Developing a Comprehensive Global Strategy on Biosecurity Education for Life Scientists, an APEX Award Application (pending).*

Along with other projects, this project particularly aims to 1) support evidence-based research and policy making; 2) facilitate effective communication and active engagement with policymakers; 3) address international challenges with academic research and public engagement; 4) provide educational material for the general public on biological and chemical security issues; and 5) promote research communities and collaborations within London Metropolitan University and beyond.

## **2. Overview of the report to Parliamentary and its distribution**

### **2.1 Report**

The project aimed to produce a short 5,000 word jargon-free summary of the present state of these two regimes and of the options for strengthening them in the immediate future through to 2023. All six authors were responsible for the whole report, but different people took responsibility for drafting different sections according to their research specialisations. The report was written and produced in hard copy in late January 2021 according to the plan<sup>2</sup>. The contents were arranged as shown in Figure 1.

#### ***Figure 1: The Contents of the Report***

1. Introduction
2. The Biological and Toxin Weapons Convention (BTWC)
  - Cooperation and Assistance (MX1)
  - Review of Science and Technology under the BTWC (MX2)
  - National Implementation of the BTWC (MX3)
  - Assistance, Response and Preparedness under the BTWC (MX4)
  - Institutional Strengthening of the BTWC (MX5)
3. The Chemical Weapons Convention (CWC)
  - Syria
  - Novichoks
  - Central Nervous System-Acting Chemicals
  - Riot Control Agents (RCAs)
  - RCAs Means of Delivery
- 4 Conclusions and Recommendations
- References

In order to help people unfamiliar with the subject of the report, a Summary section was provided at the start and specific recommendations were set out both in the Summary section and in the final section 4 on Conclusions and Recommendations. For those readers who wanted to delve deeper into these issues we also provided a full set of 59 references. The whole report fitted into a 16- page document with biographical details on the authors on the final back cover.

## **2.2 Distribution of the report**

Printed copies of the report were sent to the 125 members of the House of Commons and House of Lords who were selected mainly by their participation in the relevant Select Committees such as *the Joint Committee on the National Security Strategy, Defence Committee, Foreign Affairs Committee, Health and Social Care Committee, Environment, Food and Rural Affairs Committee, Science and Technology Committee* of House of Commons; *International Relations and Defence Committee, Food, Poverty, Health and the Environment Committee* of House of Lords; and members with *Front Bench* responsibilities. Copies were also sent to relevant support facilities within the Parliament such as the Knowledge Exchange Unit at The Parliamentary Office of Science and Technology, House of Commons Library, and House of Lords Library.

At the same time a London Metropolitan University Press Release was sent out to a range of journalists with potential interest in the subject. Given the overwhelming concentration of the media on dealing with the immediate problem of the impact of the pandemic we were not expecting too much from the Press Release. However, it turned out we were quite surprised by our success. Frank Gardner, the BBC Security Correspondent gave our work an airing on the important *Today* radio programme<sup>3</sup> and the widely read regional newspaper the *Yorkshire Post* gave an excellent summary of the Report<sup>4</sup>. Furthermore, the most thorough coverage was a long and detailed interview (written by Gwyn Winfield, the chief editor) with Professor Shang in the specialist journal *CBRNe World* which reaches many people involved in chemical and biological defence issues around the world<sup>5</sup>.

London Metropolitan University provided a dedicated webpage for the project<sup>6</sup>. Therefore the report is freely accessible<sup>7</sup>. The digital copies of the report were sent to the Parliamentarians a few days after publication (as many were expected not to be frequently in London given the pandemic conditions). The electronic version of the report was also disseminated to our networking and collaborators around the world, such as the Center for Biosafety Research and Strategy; Tianjin University, China; UNIDIR and the UN BTWC Implement Support Unit.

## **3. New Methods of Publicizing the Report**

In our original project plan, a public lecture was to be held at London Metropolitan University but due to the lockdown this became impossible. We changed our plan so as to have a webinar and we also reconsidered how we could use the social media to best publicize the report. We organized the webinar and created a subproject to produce a series of cartoons. Both new approaches turned to be very successful. We review them below.

### **3.1 Webinar**

#### ***Preparation and promotion***

Our main plan in the conditions at the end of January 2021 was to contact as many people as possible using a webinar. We therefore replaced the public lecture originally planned with an online webinar. The promotion of the webinar was carried out in the beginning of the New Year to allow maximum of visibility. The Research Postgraduate Office (RPO) at London Metropolitan University was heavily involved in its delivery and gave great support. The webinar was also carefully advertised through our own networks by the University Media Centre and two short videos<sup>8,9</sup> prepared to go onto the internet during the period when people could register and when they were waiting for the webinar to begin after signing in. Using the short video to promote the webinar is something new we introduced in the project. We found it is very effective and clearly attracted people's attention immediately. We will explore this

method in the future projects. The event was promoted via our internal network, including internal research mailing list and doctoral studies Weblearn through the University RPO.

### ***Delivery***

The webinar consisted of a short introduction by Professor Shang and then short presentations by the team which ran through the contents of the Report and ended with the introduction of a cartoon. The presentations were followed by a Q&A session. The webinar lasted for one and half hours. The event was recorded and is available to watch on demand via the project website<sup>10</sup>. The webinar recording and follow-up survey (see appendix) were shared with all registered attendees.

We had 279 people registered on the Eventbrite, and around 175 people attended the webinar, including those who joined via anonymous dial-in. Registered attendees came from over 40 different countries, such as United States-37%, UK-17%, Germany-5%, France-3%, Canada-3%, Switzerland-3%, and others. 3% were London Metropolitan University staff and students, 97% were from outside.

We also analyzed the background of the registered attendees. 21% were members of staff at another HE institution, or a student at another HE institution, 10%. 67% were not affiliated with another HE education institution, and 2% gave no answer. In those who are not affiliated with another HE education institution, 41% are from the public sector (not Higher Education), 9% from the private sector, 4% from the voluntary sector, and 19% from other sectors and 27% gave no answer.

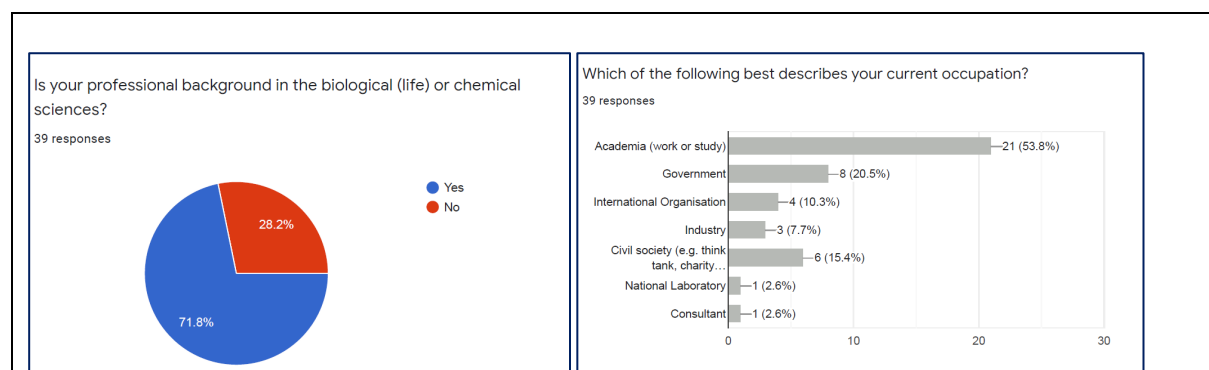
From these data, we are very pleased about the coverage of our targeted audience, and this therefore guaranteed a successful delivery of the aims of the project to a broad audiences. This is also evidenced in the feedback survey analysis below.

### ***Feedback survey***

We carried out a webinar feedback online survey after the webinar (see Appendix), and the purpose of the survey was to elicit general views of the webinar and opinions on some of the key issues addressed in the report and webinar presentations.

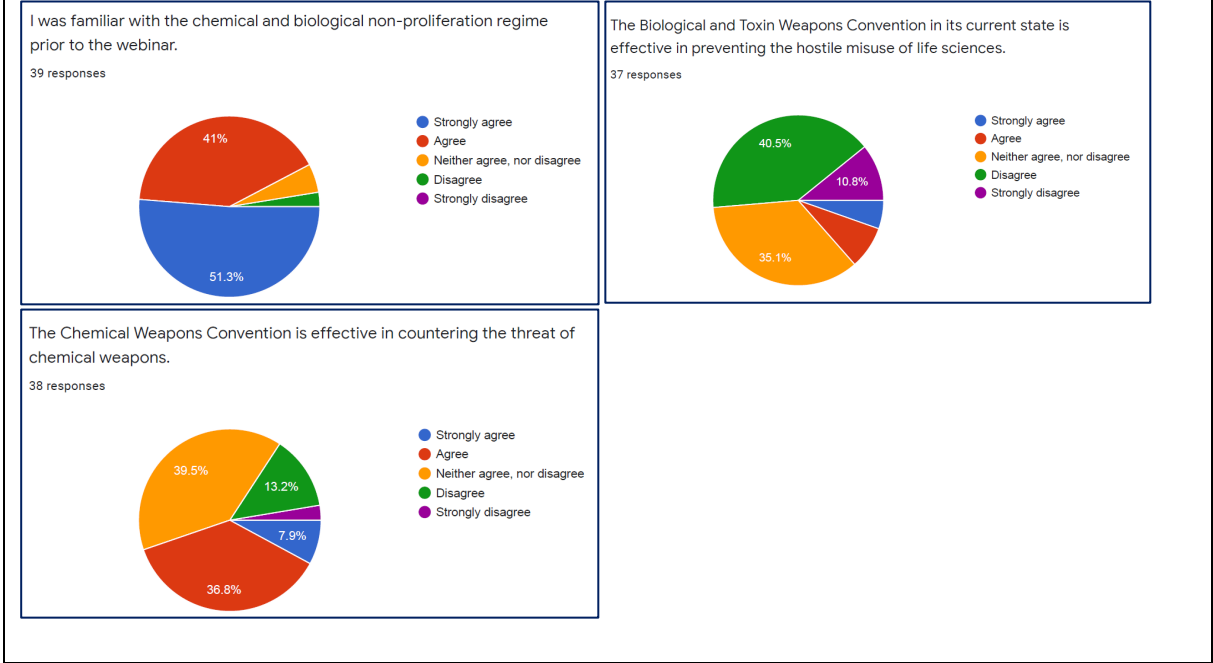
The survey received excellent feedback. 39 people took part in the webinar follow-up survey. 72% of survey respondents indicated that their professional background was in the life or chemical sciences. In terms of occupation, different professional spheres including academia, government, international organisations, industry, and civil society organisations were presented (Box 1).

Box 1: Professional background of survey respondents



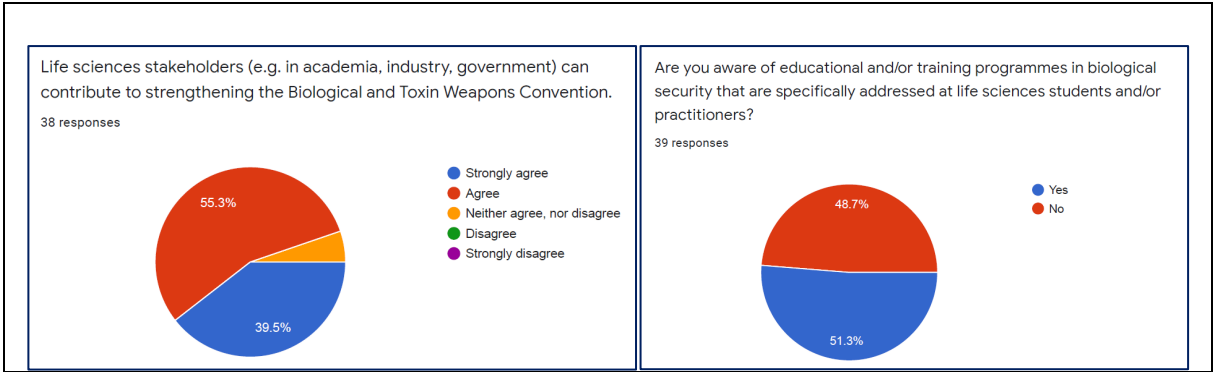
Survey respondents were largely familiar with the chemical and biological non-proliferation regime. The majority of respondents were not convinced that either the Biological and Toxin Weapons Convention (BTWC) or the Chemical Weapons Convention (CWC) in their current state are effective in countering the threat of biological and chemical weapons (Box 2).

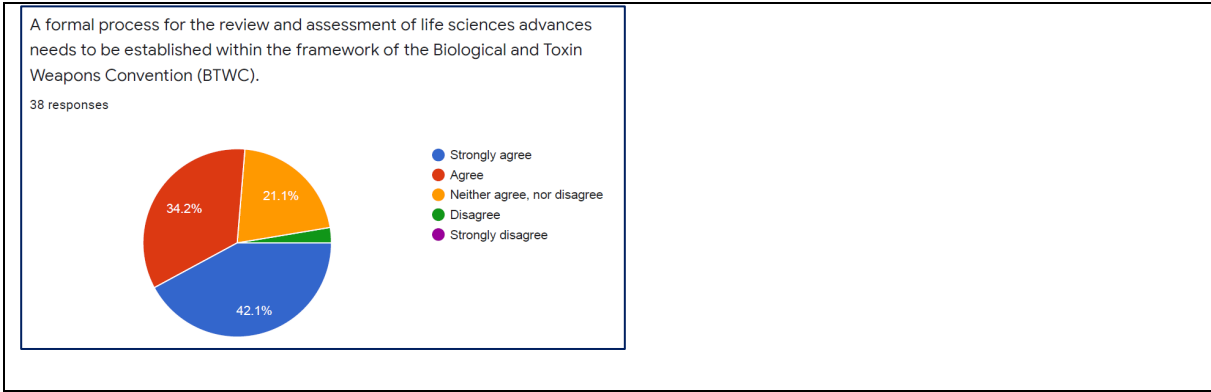
Box 2: Level of awareness of the chemical and biological non-proliferation regime



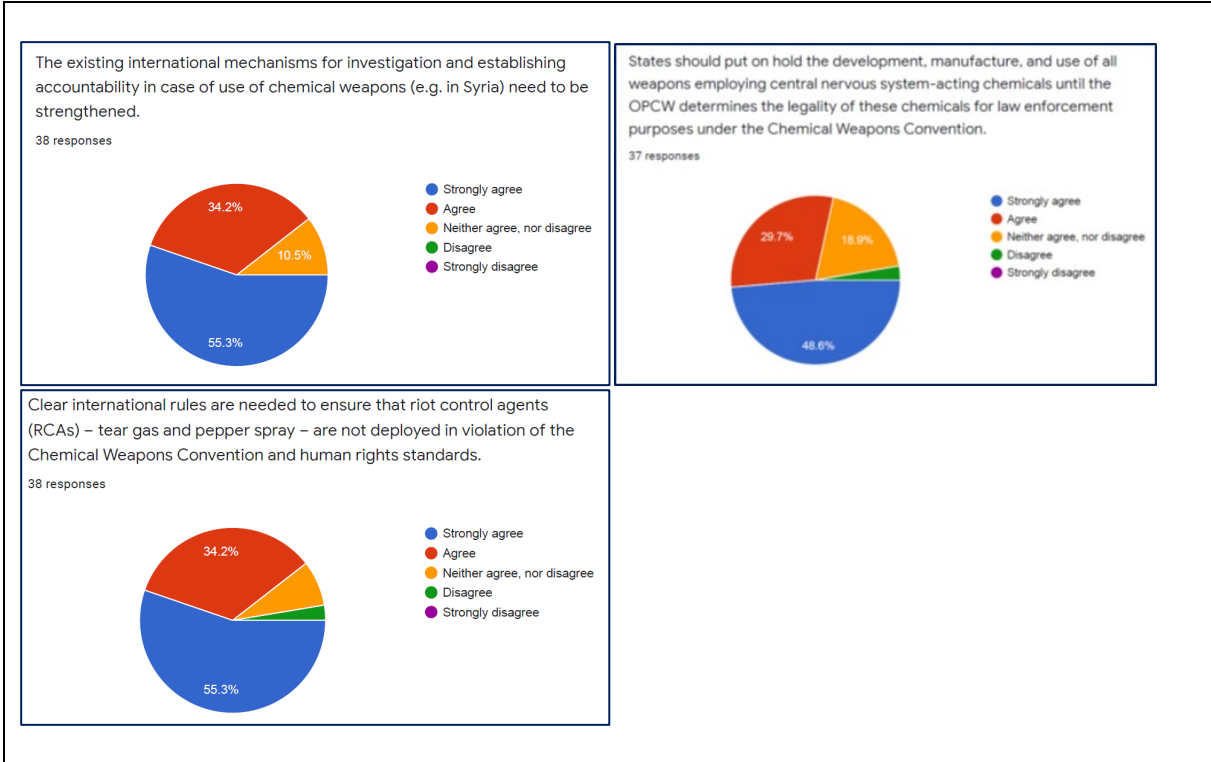
Survey respondents largely supported the options for strengthening the BTWC and CWC identified in the report. Boxes 3 and 4 provided summaries of responses on some of our selected questions representing some of main concerns in current situations. Due to the limited time and the nature of the webinar, detailed recommendations and options on strengthening BTWC and CWC were not able to be fully discussed. We planned to provide a full report which will be used at the BTWC review conference along with our other projects.

Box 3: Opinions on the Biological and Toxin Weapons Convention (BTWC)





Box 4: Opinions on the Chemical Weapons Convention



As part of the survey, participants were invited to share their views on the prospects for strengthening the chemical and biological non-proliferation regime (Box 5), as well as any general impressions of the webinar (Box 6). These were also reflected in some of interesting questions and discussions during the webinar Q&A session. In general, all these responses showed great passion and willingness to be involved in BTWC and CWC issues, particularly from many life scientists. This met our purpose of raising awareness and engaging with the general public. From the survey, there is clearly a need to have more this kind of webinar for education and discussion.

Box 5: Survey respondents’ views on the strengthening of the CBW disarmament regime

*“There is little prospect for improved organizational approaches to strengthen the BTWC – the (correct) observation that the BWC has limited capability to prevent the hostile use of the life sciences does not mean that modification of the BTWC or its institutional structure could change that. You did not ask the latter question and should not assume that limitations in the current regime*



*automatically mean those limitations can be fixed. More can probably be done to clarify what is permitted and not permitted in the CWC regime.”*

*“Scientists working with dual-use materials and technologies are the key stakeholders of the regimes. Unfortunately, most of them have never heard of the BWC or CWC. In most countries, non-proliferation regimes are perceived as political meetings of the Ministry of Foreign Affairs. This disconnect needs to be rectified by raising awareness and engaging the broader scientific community, if we are to strengthen the non-proliferation regimes.”*

*“Far wider outreach is needed to ensure the implications of the regimes are understood among all scientists and clear, realistic repercussions are needed to act as a deterrent. The BTWC has no authority so has very little leverage to ensure adherence. This should be addressed as a matter of urgency.”*

*“It is going to be a very difficult road. The political environment seems ever more resistant to such change.”*

*“Processes will continue and the context for application of procedures and requirements will change. In principle, some of this may be said to be a strengthening. It is not possible to state with certainty. Views and understanding will inevitably vary.”*

*“Prospects will improve once geopolitical tensions are reduced.”*

*“Difficult at present given the divergence of views between Russia and allies in one camp and Western nations in the other.”*

*“Although civil society/academia and others can contribute to the strengthening of the regimes, nothing can happen with the States Parties not willing to end the almost deadlock. Main spoilers Iran, Russia and the US have to start a dialogue (again).”*

*“The main issue is that the BTWC and CWC have limited enforcement and accountability. There does need to be a mechanism like OPCW for bioweapons or suspicions of biological weapons, this would assuage COVID-19 type conspiracies and further elements of the Conventions.”*

#### Box 6: Survey respondents’ general impressions of the webinar

*“Good webinar. Important issues covered.”*

*“I was a little disappointed that more was not connected to COVID-19 specifically given the title of the webinar; much of the discussion focused on the BWC/CWC and their futures in general.”*

*“Terrific program. Efficient and compact (essential for pandemic times, sadly). Good speakers although more balanced with respect to gender and age might be helpful.”*

*“I enjoyed it. It was a good background review. We still need to discuss in great depth the impact of COVID-19 on the BTWC.”*

*“It was short but an excellent webinar.”*

*“Good mix of speakers and topics.”*

*“Covering important aspects, broad and presented in an understandable way.”*

*“There were too many reporters for just one hour.”*

*"It was a good introduction to the regimes but did not really address the pandemic and potential effects of it, which was my reason for attending. The Q&A session went into a little more detail on this matter but I was hoping for more reflection in the main presentation."*

*"Impressive attendance from around the world."*

*"It is good introduction for the general audience. It does not actually discuss protocols or processes post-pandemic."*

### **Summary**

From the above survey, the following conclusions are drawn:

- The webinar was effective in promoting awareness and fostering a debate on the future of the CB non-proliferation and disarmament regime after COVID-19.
- The webinar was well attended by a wide range of stakeholders from different countries around the world.
- The webinar has demonstrated that novel communication tools, such as videos and cartoons are effective in conveying core concepts.

### **3.2 Cartoons**

Finding an effective way to inform the general public and those who are new to the area of BTWC has always been one of our main objectives. However, earlier research on this subject has revealed some of the challenges to promoting awareness and understanding of biological security and dual-use issues, as well as the utility of scenarios for illustrating these issues in a more interesting and easily assimilated form. Therefore, at the beginning of the project, we chose to use a new approach which entailed designing cartoons to convey the complexity of BTWC issues. A sample cartoon<sup>11</sup> was developed and presented during the webinar. The cartoon was well received.

Therefore, we decided to extend this venture further to produce a series of cartoons around the current topics that are in the focus of BTWC and CWC activities. The rationale behind the cartoon series was to produce a novel biological security educational tool which could be used for teaching and training. For example, the cartoons could be used as illustrative scenarios for generating discussion on key issues of relevance to the BTWC. The tool could easily be adapted for use with stakeholders in the chemical sciences which is why it is considered relevant to the purposes of both the BTWC and CWC. We have produced five cartoons in this series and titled the series '*Strengthening the Web of Prevention against Chemical and Biological Weapons after COVID-19*'. The cartoons focus on five key issues related to biological and chemical security: 1) Preventing Biological Weapons; 2) Codes of Conduct; 3) Education and Awareness-Raising; 4) Evaluation; and 5) Integration.

Due to the popularity of these cartoons from audience all over of the world in our webinar, and also our dedicated efforts to promote this effective way of dissemination, we decided to have all of these cartoons translated into the six official UN languages (Arabic, Chinese, English, French, Russian, and Spanish)<sup>12</sup>. The translations have been produced by experts in the field of biological and chemical security education. A stage two subproject for translating the cartoons in other languages such as Japanese, German, Italian, Portuguese, Greek, and etc is also under the way and will be finished in due course. We have already received kind comments from our colleagues and expressed their willingness to use our cartoons in their website or teaching.

## **4. Reflection and Feedback**

Our original intention was to visit the Houses of Parliament and to talk to a number of MPs and Lords about their response to our Report. Unfortunately given the pandemic and the national lockdown this was not possible. Therefore, we closely monitored what other ways could be used to achieve our planned activities.

### **4.1 Active approach and utilising of existing facilities**

During the process of this project engaging with Parliament, we closely followed the existing advice provided from within Parliament. The Knowledge Exchange Unit of the UK Parliament helps to facilitate the provision of relevant civil society research to members of Parliament and has a very useful website with advice on the best ways to provide research to Parliament<sup>13</sup>. We followed their guidelines closely for example by focusing on the members of relevant Select Committees, and particularly on *the Joint Committee for National Security Strategy* as people within our project group had made submissions related to our report to the Committee's report on *Biosecurity and National Security* published in December 2020<sup>14</sup> and to the same Committee in the last Parliament.<sup>15,16</sup> We also followed the detailed advice on how a report should be kept clear and concise with a short summary to begin, but with full detailed references that could easily be checked. With our cartoons we additionally followed the advice to use visual materials<sup>17</sup>. Their advice on publicity in order to get members' attention to the report was also followed closely with the Press Release and the webinar aimed at increasing interest in the report. We had intended when planning the report in late 2020 to discuss our report in face-to-face interviews with members after publication, but that was not possible in the lockdown period. However, it is our intention to do this later in the year when travel is possible, and States Parties are again able to meet in The Hague and Geneva.

### **4.2 Monitoring and impact**

We designed dedicated webinar and report feedback online survey (details see above). This helped us to reflect and assess the success of the project. We received a detailed and encouraging reply from one member of the House of Lords suggesting a specific way in which our report could have been presented in a more useful way for Parliament and indicating a willingness to try arrange a virtual meeting for us with an appropriate all-party group of members and their researchers. Due to the time, we are not able to further develop other ways of using video for dissemination. This is something we plan to do in the future projects.

As to our new venture of developing a series of cartoons for communicating with Parliament and general publics, we received immediate feedback and we have even seen some of its initial impact. One colleague (Maria Espona in Argentina) wrote: "We are starting a responsible science (linked to export control) project in Armenia, and Emilyya Titanyan, who is leading it, attended your latest [webinar] event. I suggested to use the cartoons as a tool, and she developed the attached ones. These are preliminary, but I think it is a superb starting point! I am thrilled about this! It is so great to see the impact of your job on younger generations." We therefore extended our original cartoon production into a sub project (see above). This project was highly appraised by our colleagues in the areas. Therefore, we asked some of them to help us to translate them into their native languages, they all volunteered to help. We believe this will not only communicate BTWC issues in a simpler way but also will bring some impact to help others to explore their own ways of thinking. This work is written as a paper and to be submitted to *Frontiers in Political Science*.

### **4.3 Opportunity for promotion**

Apart from the above ways to publishing our project, we have also sought opportunities when we go to conferences and meetings of States Parties later this year and next year. We produced two posters and submitted to the SCIENCE · PEACE · SECURITY '21 conference, 8-10 September 2021, RWTH Aachen University, Germany (sps21.fonas.org). This conference will address five specific themes: (1) Bringing Science and Politics closer together, (2) Confidence Building Measures, Treaties and Institutions, (3) Dual-use Technology & Responsible Innovation, (4) Information Manipulation & Disinformation, and (5) Increasing Autonomy in Weapon Systems. Therefore, it is a good fit for reporting our project.

We will also link this project with our other ongoing projects (see above) to further engage more with the Parliament and the general publics.

## **5. Impact of the Project and future work**

The 2018 *UK Biological Security Strategy*<sup>17</sup> was widely considered to be of high quality. It covered understanding, preventing, detecting and responding to the threat from the UK's strong scientific and industrial base. The importance of the BTWC and other international agreements was noted with the Strategy stating that the strategy would involve:

“Continuing to engage with the USA, Canada and other international partners both bilaterally and in forums such as the GP, BTWC, UNSGM and Australia Group in order to:

- Maintain and enhance the international legal regime prohibiting biological weapons;
- Strengthen control of dangerous biological materials, associated equipment and expertise to prevent accidental release and deliberate or accidental misuse – this includes coordination of export controls to prevent exports contributing to the development of biological weapons;
- Strengthen UN operational capabilities to investigate allegations of biological weapon use.”

As was pointed out in the *Joint Committee on National Security Strategy's* first report in December 2020<sup>18</sup>, the strategy did not prove to be effectively implemented during the COVID-19 pandemic. The Government's response<sup>19</sup> to the Joint Committee's report makes it clear that there will be a major review and practical response to this failure. The response stating in reply, for example, in regard to Recommendation 11:

“Government will, at an appropriate time, review the UK Biological Security Strategy in light of lessons learnt from responding to the COVID-19 pandemic. A list of principal commitments and an operational action plan for delivering them will likely be developed as part of this process. Progress against commitments will be monitored by a refreshed governance structure with a greater focus on human and animal health.”

And in reply to Recommendation 12 that:

“The Government takes biosecurity very seriously and has already established the new Institute for Health Protection to advance the UK's response to the COVID-19 pandemic, using a rigorous science-led approach. Urgent work to identify where responsibility for biosecurity should sit long-term is underway, and we recognise the need for a resilient and enduring approach to biological security. A greater focus on human, animal, and plant health will be fundamental. Government will strengthen links to the National Security Risk Assessment process, and between government departments, professional associations, academia and industry to ensure rapid progress is made in this important area.”

And in reply to Recommendation 13 that:

“The Government is in the midst of managing a public health emergency the like of which we have not seen for generations. It would be unwise to commit to a new biological security approach until we have learnt all of the lessons from the COVID-19 pandemic. We absolutely recognise the importance of a clear strategic direction for biological security, which is refreshed on a regular basis. Our experience of responding to other health and biosecurity emergencies, along with new and emerging risks, will help inform our approach. We will also consider declassifying information about the methodologies for assessing the impact and likelihood of natural hazards to help inspire greater public confidence and debate.”

Within that process of reviewing and reinvigorating the UK’s *Biological Security Strategy* there would appear to be many opportunities for civil society to assist in the process, including in relation to the Chemical and Biological Disarmament and Non-Proliferation Regimes.

For a very recent example, at the recent Organisation for the Prohibition of Chemical Weapons 96th Session of the Executive Council, a Statement by the Permanent Representative of Switzerland to the OPCW also emphasized the role of civil society input in regard to one of the key points in our report on the dangers of CNS-Acting Chemicals (CNSACs):

“This initiative builds on the work previously conducted over many years by a group of States-Parties, but also on the efforts of the scientific community and civil society. Of particular importance is the extensive work of the Scientific Advisory Board (SAB) in characterizing and identifying riot control (RCA) agents and underlining that in contrast to RCAs aerosolized CNSACs cannot currently be safely used for law enforcement.”

This project is an excellent example of how civil society input can be achieved. During the short period of time of the project, there are two reports, three videos, and five cartoons in about twelve languages were produced and two papers to be written and submitted. The project held a webinar and planned several interviews and useful feedback from Parliamentarians.

The specific future work from this project would be:

- Engaging of parliament and future project, including the government department involvement, and following up;
- Awareness raising for academic and general public ;
- Networking and research collaboration (team work, extended networking with China, American, India, UN etc and leading to further development to building up LMU centre for Biosecurity);
- Part of longterm research strategy of civil society input to biosecurity and parallel work with other ongoing and pending projects.

## **Acknowledgement**

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## **Appendix**

### **Webinar Feedback Form**

## The Chemical and Biological Non-Proliferation Regime after COVID-19

Thank you for taking part in today's webinar. We would appreciate your feedback on the issues raised during the webinar. The survey is anonymous and its results may appear in the final project report.

1. Please share any general impressions and comments on the webinar.
  - [open question]
2. I was familiar with the chemical and biological non-proliferation regime prior to the webinar.
  - Strongly agree
  - Agree
  - Neither agree, nor disagree
  - Disagree
  - Strongly disagree
3. I am interested in chemical and biological non-proliferation and disarmament issues.
  - Strongly agree
  - Agree
  - Neither agree, nor disagree
  - Disagree
  - Strongly disagree
4. I am aware of recent developments in the Biological and Toxin Weapons Convention (BTWC) and/or the Chemical Weapons Convention.
  - Strongly agree
  - Agree
  - Neither agree, nor disagree
  - Disagree
  - Strongly disagree
5. The Biological and Toxin Weapons Convention is effective in preventing the hostile misuse of life sciences?
  - Strongly agree
  - Agree
  - Neither agree, nor disagree
  - Disagree
  - Strongly disagree
6. Life sciences stakeholders (e.g. in academia, industry, government) can contribute to strengthening the Biological and Toxin Weapons Convention.
  - Strongly agree
  - Agree
  - Neither agree, nor disagree
  - Disagree
  - Strongly disagree
7. Are you aware of educational and/or training programmes in biological security that are specifically addressed at life sciences students and/or practitioners?
  - Yes
  - No

8. A formal process for the review and assessment of life sciences advances needs to be established within the framework of the Biological and Toxin Weapons Convention (BTWC).

- Strongly agree
- Agree
- Neither agree, nor disagree
- Disagree
- Strongly disagree

9. The Chemical Weapons Convention is effective in countering the threat of chemical weapons.

- Strongly agree
- Agree
- Neither agree, nor disagree
- Disagree
- Strongly disagree

10. The existing international mechanisms for investigation and establishing accountability in case of use of chemical weapons (e.g. in Syria) need to be strengthened.

- Strongly agree
- Agree
- Neither agree, nor disagree
- Disagree
- Strongly disagree

11. States should put on hold the development, manufacture, and use of all weapons employing central nervous system-acting chemicals until the OPCW determines the legality of these chemicals for law enforcement purposes under the Chemical Weapons Convention.

- Strongly agree
- Agree
- Neither agree, nor disagree
- Disagree
- Strongly disagree

12. Clear international rules are needed to ensure that riot control agents (RCAs) – tear gas and pepper spray – are not deployed in violation of the Chemical Weapons Convention and human rights standards.

- Strongly agree
- Agree
- Neither agree, nor disagree
- Disagree
- Strongly disagree

13. Civil society (e.g. academia, think tanks, industry, and professional associations) has a role to play in strengthening the chemical and biological non-proliferation and disarmament regime.

- Strongly agree
- Agree
- Neither agree, nor disagree
- Disagree
- Strongly disagree

14. In your view, what are the prospects for strengthening the chemical and biological non-proliferation and disarmament regime?

- [open question]

Finally, please tell us a bit about yourself:

Is your professional background in the biological or chemical sciences?

- Yes
- No

Which of the following best describes your current occupation?

- Academia (work or study)
- Government
- International Organisation
- Industry
- Civil society (e.g. think tank, charity etc.)
- Other

## References

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<sup>2</sup> Shang, L., Novossiolova, T. Crowley, M., Edwards, B. Whitby, S. and Dando, M. (2021) *Biological and Chemical Security After COVID-19: Options for Strengthening the Chemical and Biological Weapons Disarmament and Non-Proliferation Regimes*. London Metropolitan University, London, January.

<sup>3</sup> BBC Today programme. 8 Feb, 2021, 7:06 am. <https://www.bbc.co.uk/sounds/play/m000s1rd>

<sup>4</sup> Yorkshire Post: <https://www.pressreader.com/uk/yorkshire-post/20210208/281509343875091>

<sup>5</sup> Winfield, G. (2021) Strengthening the Ties that Bind. *CBRNe World*, February, 14 -18.

<https://cbrneworld.com/news/experts-call-for-action-on-chemical-and-biological-security-governance-after-the-pandemic>

<sup>6</sup> <https://www.londonmet.ac.uk/research/research-initiatives/biological-and-chemical-security-project/>

<sup>7</sup> <https://www.londonmet.ac.uk/research/research-initiatives/biological-and-chemical-security-project/biological-and-chemical-security-after-covid-19/>

<sup>8</sup> <https://youtu.be/b9DiaW6IAus>

<sup>9</sup> <https://youtu.be/WcOTiAXxlwo>

<sup>10</sup> <https://youtu.be/lfA6SCMHTmE>

<sup>11</sup> <https://www.londonmet.ac.uk/research/research-initiatives/biological-and-chemical-security-project/cartoons/preventing-biological-weapons/>

<sup>12</sup> <https://www.londonmet.ac.uk/research/research-initiatives/biological-and-chemical-security-project/>

<sup>13</sup> <https://www.parliament.uk/get-involved/research-impact-at-the-uk-parliament/knowledge-exchange-at-uk-parliament/>

<sup>14</sup> Joint Committee on National Security Strategy (2020) *Biosecurity and national security: First Report of Session 2019-21*. HC6112, HL195, House of Commons, House of Lords, London, 18 December.

<sup>15</sup> Written Evidence to the First Report: Dr. Tatyana Novossiolova and Professor Malcolm Dando BN50029, 27 October (reference 278 on page 47).

<sup>16</sup> Evidence to the previous enquiry; Dr Simon Whitby and Professor Malcolm Dando (2018) *Education and Awareness-Raising on Biological Security and Dual Use: A Critical Aspect of Effective Implementation of the Biological Security Strategy*. BHH0002.

<sup>17</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/730213/2018\\_UK\\_Biological\\_Security\\_Strategy.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/730213/2018_UK_Biological_Security_Strategy.pdf)

<sup>18</sup> <https://publications.parliament.uk/pa/jt5801/jtselect/jtnatsec/1279/127902.htm>

<sup>19</sup> <https://committees.parliament.uk/publications/4870/documents/49008/default/>