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Dual-Use Oversight: Is the Scientific Community Fit for Purpose? What Should Be Done if it is Not?

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The United States Office of Science and Technology Policy (OSTP) has just invited comments on potential changes to the *Policies for Federal and Institutional Oversight of Life Sciences Dual Use Research of Concern (DURC) and Recommended Policy Guidance for Departmental Development of Review Mechanisms for Potential Pandemic Pathogen Care and Oversight (P3CO)*.¹ No doubt similar high-level discussions of policies to deal with dual use are underway in many other countries after the COVID-19 pandemic has demonstrated how dangerous an inadvertent or deliberate use of biological agents could potentially be for modern society. Unlike the issue of nuclear weapons use, the problem of the deliberate use of biological agents is certain to get worse in future, as advances in biotechnology place more and more capabilities for malign misuse in an ever-increasing number of hands.

Unfortunately, the World Health Organization's new *Global Guidance Framework for the Responsible Use of the Life Sciences* correctly asserted that: "A chronic and fundamental challenge is a widespread lack of awareness that work in this area – which is predominantly undertaken to advance knowledge and tools to improve health, economies, and societies – could be conducted or misused in ways that result in health and security risks to the public. Also, incentives to identify and mitigate such risks are lacking."² The question therefore arises as to whether the life science community worldwide is capable of engaging successfully in the implementation of novel policies to deal with dual use. Given the broad ignorance of the problem, the answer to that question is clearly no. The life science community is not fit for the purpose of helping to protect its benignly intended work from such misuse. A second question therefore arises as to what should be done. We address that second question in the rest of this paper.

The United Nations Institute for Disarmament Research (UNIDR) stressed recently that the international prohibition of misuse of life and associated sciences, which is embodied in the 1925 Geneva Protocol, the Biological and Toxin Weapons Convention (BTWC) and the Chemical Weapons Convention (CWC), cannot be maintained just by State Parties. Instead, it will need the assistance of many other stakeholders from civil society, including the scientists involved in creating the biotechnology revolution³.

State Parties to the International Conventions are, however, faced with the fundamental problem that the scientists creating this revolution in life sciences have little understanding of the issue of dual-use and biosecurity. States have tried to address this challenge through guidance on appropriate codes of conduct for scientists. For example, the State Parties to the CWC agreed the *Hague Ethical Guidelines* in 2015⁴ and BTWC State Parties are currently considering the *Tianjin Biosecurity Guidelines*⁵. However, it is clear that scientists who are not aware of the seriousness of the potential misuse of their benignly intended work are not likely to engage effectively with such codes and support the maintenance and development of the disarmament regime. Both the *Hague Ethical Guidelines* and the *Tianjin Biosecurity Guidelines* therefore have awareness-raising and education amongst their key elements. The recent CWC Science Advisory Board Report for the CWC Review Conference also emphasised this, particularly in relation to the relevant biotechnology and the role of scientists⁶. The recent medium-term plan from the Organisation for the Prohibition of Chemical Weapons (OPCW)⁷ further stressed the need for education and detailed guidelines. The new *UK National Biosecurity Strategy* also emphasised this aspect⁸.

Efforts to improve the awareness and education of life scientists have been conducted over the past two decades. These efforts worldwide demonstrated that much of what is needed to improve the biosecurity education of life and associated scientists has been developed, but there are also some significant deficiencies⁹. For example, efforts to date have been fragmented, with initiatives varying widely in focus, format, content and scope. In short, overall biosecurity and dual-use awareness levels remain low among life and associated scientists and there is no effective and agreed implementation plan for changing this situation¹⁰. The implications of a lack of education on biosecurity matters could potentially have serious impacts on society, life sciences, and the BWC itself.

State Parties to the BTWC have reached a consensus agreement that a radical change in how science and technology is dealt with under the Convention must be a major issue for decision during the current intersessional period up to the 10th Review Conference¹¹. One item is a repeated focus on scientific and technological developments relevant to the Convention and the setting up of a science and technology review mechanism for the Convention. The scientific community has helped to facilitate the negotiation and development of the BTWC for many years and should continue to play an important role in this process. A recent workshop that brought together experts from civil society and officials from Geneva discussed how to move forward in the new intersessional process, i.e., presenting as guests of the meeting, participating in side-events, and making specific statements¹². It was also clear that the international scientific community needs to coordinate more effectively to help clarify important issues such as effective methods of oversight of potentially dual-use research, codes of conduct for scientists under the Convention and effective biosecurity education for life scientists.

The work of the International Nuclear Security Education Network (INSEN) of the International Atomic Energy Agency (IAEA) and the Advisory Board on Education and Outreach (ABEO) under the OPCW provide useful models and lessons for consideration in building a similar framework for biosecurity education at the university level. These could address the deficiency in BTWC biosecurity education. There are initial efforts being made to

develop a similar network for life scientists, the International Biological Security Education Network (IBSEN), mainly through proactive initiatives such as the recent grant awarded to London Metropolitan University Biological Security Research Centre by the Joseph Rowntree Charitable Trust¹³. This initiative would certainly hope to lay the foundations for the network eventually to be run from the BTWC itself, just as the INSEN is run from the IAEA and OPCW is involved in CWC education.

The rapid advances in biology and the diversity of life sciences combined with technology development add extra challenges for biological security education, in particular how to keep up to date, as well as manage global dissemination and effectiveness¹⁴. All these issues should be addressed during the development of the IBSEN. If this work is successful, it could significantly improve the possibility of implementation of the BTWC's new strategy on the review of science and technology and State Parties' national policy on the Biological Security Strategy in the coming years. Early engagement with the BTWC Implementation Support Unit (ISU) and broad interaction with scientific communities around the world are therefore crucial. This network could eventually be further acknowledged and sustained through dedicated funding, such as the INSEN.

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Statement on conflict of interest

We hereby declare that there is no conflict of interest in submitting this paper.

¹ <https://www.federalregister.gov/documents/2023/09/01/2023-18906/request-for-information-potential-changes-to-the-policies-for-oversight-of-dual-use-research-of>

² <https://www.who.int/publications/i/item/9789240056107>

³ James Reville, Vivienne Zhang and María Garzón Maceda (eds.) "Stakeholder perspectives on the Biological Weapons Convention", UNIDIR, Geneva, 2022. <https://doi.org/10.37559/WMD/22/BWC/03>

⁴ <https://www.opcw.org/hague-ethical-guidelines>

⁵ https://www.interacademies.org/sites/default/files/2021-07/Tianjin-Guidelines_210707.pdf

⁶ <https://www.opcw.org/sites/default/files/documents/2023/06/rc503%28e%29.pdf>

⁷ <https://www.opcw.org/sites/default/files/documents/2023/06/rc502r1%28e%29.pdf>

⁸ <https://www.gov.uk/government/publications/uk-biological-security-strategy/uk-biological-security-strategy-html>

⁹ L. Shang, M. Mprah, I. Ravi, M. Dando, Key issues in the implementation of the Tianjin Biosecurity Guidelines for codes of conduct for scientists: A survey of biosecurity education projects, *Biosafety and Health* (2022), doi: <https://doi.org/10.1016/j.bsheal.2022.08.003>

¹⁰ Svenja Vinke, Irina Rais and Piers Millett, 'The dual-use education gap: awareness and education of life science researchers on nonpathogen-related dual-use research,' *Health Security*, Vol. 20, No. 1, 2022, DOI:10.1089/hs.2021.0177

¹¹[https://unodaweb-meetings.unoda.org/public/2022-12/2022-1221%20BWC CONF IX 9%20adv%20vers.pdf](https://unodaweb-meetings.unoda.org/public/2022-12/2022-1221%20BWC%20CONF%20IX%209%20adv%20vers.pdf)

¹² Shang, Lijun (2023) Joseph Rowntree Charitable Trust funded workshop. In: Learning from the past and looking to the future after review conference, 28 April 2023, London Metropolitan University.

<https://repository.londonmet.ac.uk/8645/>

¹³ <https://www.londonmet.ac.uk/news/articles/biological-security-research-centre/>

¹⁴ SJ Beard, Martin Rees, Catherine Richards, Clarissa Rios Rojas. The Era of Global Risk: An Introduction to Existential Risk Studies. Open Book Publishers, 2023, September.

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