# Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction

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**Standing agenda item: review of developments in the field of science and technology related to the Convention**

## Considerations and recommendations to inculcate awareness of the dual-use challenge into biosafety and biosecurity training and education for life scientists[1] in States Parties

**Submitted by Canada**

## I. Introduction

1. Article IV of the Biological Toxin Weapons Convention (BTWC) requires States Parties to "take any necessary measures to prohibit and prevent the development, production, stockpiling, acquisition, or retention of the agents, toxins, weapons, equipment and means of delivery specified in Article I of the Convention, within the territory of such State, under its jurisdiction or under its control anywhere."

2. The Sixth Review Conference in 2006 formally recognized the role education and awareness-raising has to play in effective implementation of the BTWC. The Conference urged States Parties to "promote the development of training and education programmes for those granted access to biological agents and toxins relevant to the Convention, in order to raise awareness of the risks, as well as the obligations of State Parties under the Convention".

3. The Conference further recognized the importance of education and awareness-raising by specifically devoting part of the 2007-2010 intersessional process to it, including the Meeting of States Parties 2008, when States Parties noted that formal requirements for educational formats could assist in raising awareness and the Convention's implementation, and agreeing on the value of education and awareness programmes (BWC/MSP/2008/5).

[1] In this paper 'life scientists' refers to individuals involved in the scientific study of living organisms and their products, and encompasses individuals training in non-life sciences fields (such as engineering, computer sciences and physics) who engage in life sciences work as well as individuals who engage in life sciences work outside of formal institutional structures (for example amateur biologists).

4. The Final Declaration of the Seventh Review Conference under Article IV notes the value of "national implementation measures to promote the development of training and education programmes for those granted access to biological agents and toxins relevant to the Convention and for those with the knowledge or capacity to modify such agents and toxins". The Conference also decided that education and awareness-raising about risk and benefits of life science and biotechnology would be addressed under the Standing Agenda Item on the review of developments in the field of science and technology related to the Convention. Such training and education is fundamental to ensuring the conditions whereby States Parties can develop and apply "scientific discoveries in the field of bacteriology (biology) for prevention of disease, or for other peaceful purposes" as required under Article X of the BTWC. In this regard, the working paper submitted by Australia, Canada, Japan, New Zealand, Republic of Korea and Switzerland on behalf of the JACKSNNZ, and Kenya, Sweden, Ukraine, the United Kingdom of Great Britain and Northern Ireland, and the United States of America (BWC/CONF.VII/WP.20/Rev.1) during the Seventh Review conference, highlighted key findings and preliminary conclusions on possible approaches to education and awareness-raising among life scientists, and recommended consideration of strategic and comprehensive awareness-raising on biosecurity and the obligations of the Convention among life scientist as a preventive measure in the spirit of Article IV.

## II. Advanced Certificate in International Biological Sciences Security Management Workshop

5. Previous BTWC Intersessional meetings and Review Conferences have recognized and identified a number of biosafety education and awareness-raising activities in States Parties, and to a lesser degree for biosecurity. As part of Canada's ongoing commitments under the BTWC, Canada undertook the development and delivery of a workshop curriculum with the aim of promoting BTWC awareness and compliance in Canada. The Advanced Certificate in International Biological Sciences Security workshop was a collaborative effort by a government agency (the Public Health Agency of Canada (PHAC)), a post-secondary institution (Carleton University's Norman Paterson School of International Affairs Professional Training) and global experts (independent instructors from the University of Bradford).

6. Subject matter experts worked together to develop a comprehensive curriculum focused on raising awareness on biosafety, dual-use biosecurity and bioethics, in both the Canadian and international contexts. This activity was the first step in the development of a training program that builds upon the concepts of laboratory biosafety and biosecurity to increase awareness in regards to the ethical, legal and social relevance of dual-use biosecurity, as well as the responsible conduct of research. This approach can provide a foundation for the development of policies and procedures to enhance responsibility and prevent the malicious misuse of pathogens and toxins. This Working Paper highlights some of Canada's key findings and preliminary conclusions that may be useful to consider in the development and delivery of education and awareness-raising activities within States Parties about the risks and benefits of life sciences and biotechnology.

# III. Key-findings and considerations for an integrated approach for the education and awareness-raising about risk and benefits of life sciences

## A. Content

7. The report of the National Research Council of the National Academies on the *Challenges and Opportunities for Education About Dual Use Issues in the Life Science*[2] recommends that an introduction to dual-use issues "should be incorporated within broader coursework and training rather than via stand-alone courses." The incorporation of bioethics and dual-use issues within the curriculum on biosafety and biosecurity allows for a comprehensive approach to the education and awareness-raising of life scientists.

8. In developing the content of programs for education and awareness-raising, it is recommended to address the following topics:

(a) the concepts of biosafety, biosecurity and bioethics, as well as their relevance to life sciences;

(b) relevant national and international oversight, including import/export controls and the Convention;

(c) biosafety, biosecurity, dual-use and bioethical risks of life sciences;

(d) approaches for the management of research and responsible conduct of research;

(e) dual-use conundrums and dilemmas that arise due to the impact of science and technology on society; and,

(f) communication dilemmas that arise due to ethical, legal and social considerations.

9. Existing or developed biosafety, biosecurity and bioethical content should be integrated and streamlined to develop a curriculum that highlights linkages and opportunities while avoiding overlap.

## B. Development and delivery

10. A comprehensive curriculum should be developed through coordination and collaboration with experts nationally and globally. Moreover, the curriculum should be designed in a format that allows it to respond to the level of knowledge and experience of each cohort and provides for an interactive and engaging approach, using reality-based case studies. An interactive teaching/training face-to-face model allows for in-depth discussion, group work and networking.

11. The curriculum should be delivered to a cohort of no more than 20 participants to allow for face-to-face in-depth discussions, group work, and scenario-based modeling that reflect the principles of adult learning and to allow for networking opportunities. Delivery should include the introduction and application of a toolkit to support participants following

[2] National Research Council. *Challenges and Opportunities for Education About Dual Use Issues in the Life Sciences.* Washington, DC: The National Academies Press, 2010.

the training event, providing protocols and resource information that can be applied to the learners' day-to-day work environment.

## C. Targets of education and awareness-raising

12. The target audience on biosafety, biosecurity (laboratory and dual-use) and bioethics is broad. The curriculum would require that participants have an understanding of the life sciences. However, the benefits of a diverse audience from different sectors, including life scientists, biosafety and biosecurity professionals, regulators, journal editors, and funding agencies, allows for different perspectives, fervent discussions and networking opportunities.

13. A comprehensive curriculum may be provided as part of continuing professional education. This could include a train-the-trainer course, which may also facilitate the dissemination of the information. The curriculum may also be amended and incorporated into existing academic curricula, making education and awareness-raising an ongoing process throughout the education and career of life scientists.

## D. Educational practitioners

14. Since the effectiveness of educational programs can be significantly influenced by the quality of the education practitioners, it is essential to secure personnel with appropriate qualifications. The level of experience should be audience dependant, recognizing that graduate-level or more advanced courses, including those that will be developing trainers, should be delivered by instructors who are practitioners if not experts in the field, whereas undergraduate or more junior level audiences require instructors with some familiarity with content, but who may not necessarily be experts. Where gaps in internal competencies may exist, collaboration with external experts using a consultancy approach allows for a balanced representation of educational practitioners across the biosafety, biosecurity and bioethics fields.

# IV. Conclusion

15. A compressive curriculum integrating dual-use, biosafety, biosecurity and bioethics, increases awareness among life scientists, provides them with new information, perspectives and tools. It also develops champions of biosafety, biosecurity, and bioethics within their own jurisdictions and organizations. Increased education and awareness not only promotes BTWC compliance, but also provides the foundation for a change in culture and practice which would support the establishment of a norm among life scientists.

16. We encourage States Parties to carry out and report back on a wide range of forward-looking initiatives to improve the awareness and education of life and associated scientists and technologists during the annual Meetings of Experts and of States Parties leading up to the Eighth Review Conference in order that best practices can be identified and implemented in many different States.