

**Seventh Review Conference of the States Parties  
to the Convention on the Prohibition of the  
Development, Production and Stockpiling  
of Bacteriological (Biological) and  
Toxin Weapons and on Their Destruction**

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Organization of the Review Conference: Background documentation

**Possible approaches to education and awareness-raising  
among life scientists**

**Submitted by Australia, Japan and Switzerland on behalf of the  
“JACKSNNZ”<sup>1</sup>, and Sweden**

**I. Introduction**

1. Article IV of the Biological and Toxin Weapons Convention (BWC) 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.” The article may be considered a linchpin, linking the general obligations of Articles I and III specifically with the domestic provisions of States Parties and thus setting the base for national implementation measures (see also other working papers such as BWC/CONF.VI/WP.3). Moreover, the wording of Article IV is wide-ranging and implies that, in addition to the necessary legal steps, other measures are also necessary for effective national implementation.

2. The Meetings of Experts during the First Intersessional Process (2003-2005) provided an ideal platform for considerations related to the oversight, development of appropriate workplace security culture (codes of conduct), education and awareness-raising among life scientists as important implementation measures at the national level. The exchanges underlined a common understanding of the pivotal role life scientists play in the effective prevention of the misuse of biotechnology and biological agents. This understanding is reflected in the Final Document of the Sixth Review Conference (BWC/CONF.VI/6), where the Conference calls upon States Parties to ensure the safety and security of microbiological or other biological agents or toxins (Part II, para. 11(iii)), and simultaneously urges the States Parties “to promote training and education programmes for those granted access to biological agents and toxins, in order to raise awareness of the

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<sup>1</sup> Japan, Australia, Canada, Republic of Korea, Switzerland, Norway, New Zealand.

risks, as well as of the obligations of States Parties under the Convention” (Part II, para. 14). 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 BWC.

3. Moreover, the Sixth Review Conference encouraged States Parties “to take necessary measures to promote awareness amongst relevant professionals of the need to report activities conducted within their territory or under their jurisdiction or under their control that could constitute a violation of the Convention or related national criminal law.” (Part II, para.15). In this context, the Final Document of the Sixth Review Conference also highlights the relevance of such national implementation measures with regard to the United Nations Security Council Resolution 1540 (2004) and the elimination or prevention of the proliferation of, in this case, biological weapons.

4. During the Second Intersessional Process (2007-2010), further considerations of biosafety and biosecurity, as well as of oversight, education and awareness-raising, enabled exchanges on possible approaches to bringing biologists on board. Discussions highlighted that biologists participating in the debates on biosafety and biosecurity (“on board”) would benefit from an increased awareness of potential risks, of the Convention’s obligations and, as a second step, of possible contributions they could provide as life science practitioners in academic, industrial and governmental institutions. In this regard, the Japanese Working Paper on behalf of JACKSNNZ (BWC/MSP/2008/MX/WP.21) highlights three effective means for the prevention of the misuse of biotechnology, namely, Oversight/Management and control, Education and awareness raising, and Codes of Conduct for Scientists. The document also emphasizes the importance of involving national stakeholders in all stages of the design and implementation of oversight frameworks, and the need to ensure that such measures do not cause unnecessary burdens and do not unduly restrict permitted biological activities. Consequently, in the Meeting of States Parties 2008, States Parties recognized the importance of awareness among those working in the biological sciences, noted that formal requirements for educational formats could assist in raising awareness and the Convention’s implementation, and agreed on the value of education and awareness programmes (BWC/MSP/2008/5, paragraphs. 25, 26 and 27).

5. Based on these considerations and the common understanding highlighted above, various States Parties, including Australia, Japan, Sweden and Switzerland, undertook individual efforts on the national level. In the case of these four particular countries, the overall aim of the activities, which were also carried out by experts of the University of Bradford (UK) as well as the University of Exeter (UK), was a stimulation of debate and reflection among researchers on life-sciences, security and the potentially destructive application of their activities. The following examples highlight experiences and key-findings made by these States Parties.

## **II. Examples of experiences made by States Parties**

6. Australia commenced its outreach and awareness-raising on BWC-related issues in 1990, with a set of Guidelines developed by the Department of Foreign Affairs and Trade, to raise the awareness of industry and researchers about the risk of inadvertent involvement in the biological weapons programs of other countries. These Guidelines have been circulated to biological industry, universities, relevant professional associations and government agencies.

7. At the BWC Meeting of Experts in 2005, Australia reported that amongst its scientific community, there was a low level of awareness of the risk of misuse of the biological sciences to assist in the development of biological weapons.<sup>2</sup> One problem identified is that many scientists working in the ‘dual-use’<sup>3</sup> areas simply do not consider the possibility that their work could inadvertently assist in a biological weapons program.

8. To address this challenge, the Guidelines have been complemented in recent years by more prioritised outreach and awareness-raising activities by Australian government agencies to target those parts of the scientific community which are most directly affected by the BWC and biosecurity-related legislation, as discussed below.

9. An education and awareness-raising program has been developed by Australia’s Department of Health and Ageing to promote recognition and understanding of the security sensitive biological agents (SSBAs) regulatory scheme established in November 2008, and to ensure that the regulated community is able to comply with their obligations. Briefings on the BWC and associated legislation, including the Crimes (Biological Weapons) Act 1976, are included in the SSBA outreach activities.

10. Australia’s Defence Export Control Office (DECO), as the agency responsible for the Customs Act 1901 and Weapons of Mass Destruction (Prevention of Proliferation) Act 1995 and their associated regulations, undertakes regular outreach seminars to provide information on the obligations related to exports of dual-use biological materials, equipment and technology. DECO also provides a range of publications which provide information on specific areas of export controls.

11. In 2006, Australia’s National Framework for the Development of Ethical Principles in Gene Technology (‘National Framework’) was published to provide a national reference point for ethical considerations relevant to environmental and health issues in gene technology, GMOs and genetically modified products. Many of these considerations are relevant to the prohibitions outlined by the BWC, or strongly complement the objectives of the Convention and/or the promotion of sound biosecurity/biosafety practices. The National Framework can play a role in helping gene technology practitioners determine in a straightforward and non-prescriptive manner how to best carry out their activities without the risk of contravening the provisions of the BWC.

12. In 2009, members of Australia’s National Centre for Biosecurity (a collaboration of the University of Sydney and the Australian National University) conducted a pilot series of four interactive seminars for Australian scientists and students on the potential security risks of laboratory research on pathogens micro-organisms, including the relevance of the BWC. This series of seminars, funded by the US-based Alfred P. Sloan Foundation, was based on the program developed in the United Kingdom by University of Bradford and University of Exeter.

13. In recognition of the high levels of cooperation necessary between Government officials and the relevant scientific communities to achieve progress in awareness-raising activities, there has been engagement by Government officials with a number of Australian

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<sup>2</sup> United Nations, Working Paper, Raising Awareness: Approaches and Opportunities for Outreach, Submitted by Australia, Document BWC/MSP/2005/MX/WP.29 (Geneva: United Nations, 21 June 2005).

<sup>3</sup> In the context of this paper, the term “dual-use” refers to the possibility that biological materials, knowledge, facilities and technologies associated with peaceful purposes may be misused for belligerent purposes. While the dual-use character itself does not automatically imply a misuse, the references to “dual-use education” in particular focus on educational modules highlighting the potential of a malevolent misuse of well-intended research results, facilitated by the dual-use character of such results.

universities, as well as the Australian Academy of Science, the National Centre for Biosecurity and relevant scientific societies, to develop a program to enable more effective outreach activities.

14. Japan expressed in its working paper submitted to the Meeting of Experts in 2008 (BWC/MSP/2008/MX/WP.21) that education and awareness raising among scientists are basic means for preventing the misuse of biotechnology, while recognizing the importance to respect the autonomous responsibility of scientists without obstructing scientific development. In the same working paper, Japan also acknowledged that ‘the development of educational programmes at the governmental level has not seen great progress’.

15. In order to mitigate such deficiencies, the National Defense Medical College (NDMC) in Japan and the University of Bradford in the UK conducted collaborative research to analyse the current state of biosecurity education in Japan<sup>4</sup>. The research found that there was a lack of educational topics on biosecurity despite a certain level of presence on dual-use references, mainly due to an absence of space in the existing curricula, an absence of time and resources to develop new curricula, an absence of expertise as well as doubt about the need for biosecurity education. Parallel to this survey, the NDMC and the University of Bradford also jointly developed an online learning module in applied dual-use biosecurity education. In addition to the efforts by the NDMC, other individual universities and institutions in Japan are taking various approaches to tackle bio-threats. Such approaches include the education on bio-ethics and social responsibility of scientists conducted by Waseda University, a project on anti-bioterrorism conducted by Keio University, and a table-top exercise on the response in the event of bioterrorism by Jikei Medical University. The University of Tokyo also launched a Global Health Leadership Program aiming at cultivating human resources capable of addressing global health challenges from cross-sectional perspectives including life ethics.

16. Encouraged by such individual activities, a wide range of applications are required for preventing misuse of biotechnology. It is, therefore, important to share best practices among scientists and institutions at national and international levels and to examine how to apply and implement such practices appropriately.

17. In Sweden, no formal survey on awareness of obligations under the BWC or of potential risks related to misuse of biological sciences/biotechnology among life scientists has been carried out to date. Although biosafety aspects are considered in national life science fora, it has become apparent from networking, discussions and informal information gathering that dual-use and biosecurity issues are less well cared for.

18. As a result of contacts generated over time at BWC- and related meetings a series of awareness-raising seminars were arranged and conducted by experts of the University of Bradford (UK) and the University of Exeter (UK) in 2009, at three academic institutions in Sweden. In conjunction with these seminars, an informal network was established with the aim of developing a national education approach, covering biosecurity and dual-use aspects within life science, adapted to local education and curriculum at each academic institution. The Swedish Ministry for Foreign Affairs and the Swedish Ministry of Education took positions in the margins of this initiative.

19. The informal network has agreed to endorse the establishment of biosafety/biosecurity committees at all academic institutions that undertake education and research in relevant fields, as one area of specific importance and with great significance

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<sup>4</sup> Masamichi Minehata and Nariyoshi Shinomiya, ‘Chapter 5: Japan: Obstacles, Lessons and Future’ in Brian Rappert ed., *Education and Ethics in the Life Sciences: Strengthening the Prohibition of Biological Weapons*, The ANU E Press, 2010

for future work also in dual-use education. These committees were suggested to have comprehensive responsibility for biosafety and biosecurity and, also, an advisory role in matters involving genetic modifications and education related to biosafety and biosecurity. Furthermore, the Centre for Research Ethics and Bioethics at Uppsala University was identified as a crucial element in any initiative to develop national bioethics, dual-use and biosecurity education. Existing educational programmes, which to some extent have started to include these topics in for instance biotechnology/engineering programs and biomedicine master programs, were identified as useful starting points for the formation of national networks with great potential for future implementation of dual-use education in Sweden.

20. Regarding awareness raising and dual-use education it has become evident that, from a European perspective, there is a convergence of BWC- and EU CBRN Action Plan<sup>5</sup>- related national commitments. The initiated bottom-up approach in this area is promising, but will require dedicated durable top-down support including provision of financial resources in order to establish a sustainable framework for facilitating the establishment of national biosecurity education in conjunction with related international efforts.

21. In Switzerland, initial surveys on awareness of potential security risks among life scientists revealed, in the vast majority of cases, a well-developed sense for aspects related to biosafety, but a considerably limited knowledge of aspects related to biosecurity. Moreover, most life scientists seem to be unaware of the BWC's obligations as well as the obligations' relevance to their work. Based on these findings, the Swiss government started to sensitize researchers with a brochure in 2008 ("Biology for Peace") and accompanied a series of awareness-raising seminars conducted by experts of the University of Bradford (UK) as well as the University of Exeter (UK) at various academic institutions in Switzerland in 2009. Further awareness-raising sessions organized and conducted by the Swiss government itself took place in 2010. The analysis of reactions by the attending audience revealed

(a) that life scientists consider awareness-raising on aspects related to security as important (some even spoke of an "eye-opener"),

(b) that, due to the general academic autonomy and freedom of research and teaching in Switzerland, a governmental imposition of content within the curriculum would be met with scepticism,

(c) that particularly legally binding top-down approaches would therefore be inappropriate,

(d) that it is important to consider existing patterns of cooperation among researchers, institutions, and authorities, and that these existing patterns provide ideal platforms for an outreach, and

(e) that awareness-raising activities in the regular study and work environment of life scientists similarly provide an ideal base.

22. These lessons learned provide the base for possible ways forward, such as the inclusion of educational modules on biosecurity for biosafety officers in research facilities, or the encouragement to introduce educational modules on biosecurity in academic courses for future life scientists.

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<sup>5</sup> EU CBRN Action Plan:  
[http://europa.eu/legislation\\_summaries/justice\\_freedom\\_security/fight\\_against\\_terrorism/jl0030\\_en.htm](http://europa.eu/legislation_summaries/justice_freedom_security/fight_against_terrorism/jl0030_en.htm)  
 [viewed 5 April 2011].

23. The findings of continued academic research on bioethics and the potential presence of awareness (or rather unawareness) of risks related to biosecurity among life scientists seem to confirm a generally limited level of awareness in numerous life science institutions in numerous countries.<sup>6</sup> Analysis of the reasons for this lack of awareness include, *inter alia*, the lack of university courses covering aspects related to the BWC and related (bio-)security issues, either because the curriculum developers do not consider the topic to be important or have difficulty fitting teaching material on biosecurity into what they claim is an already overcrowded curriculum, or because of a lack of expertise and access to relevant teaching material.

24. The experiences of particular States Parties as well as the complementary findings of academic research on awareness of bioethics confirm that further initiatives by the States Parties to the BWC are needed in order to enhance the implementation of the Convention through education of and awareness-raising among life scientists as a preventive national implementation measure. The States Parties submitting this working paper therefore particularly encourage considerations on the following aspects in the run-up and during the forthcoming Review Conference:

### III. Possible considerations by States Parties at the Seventh Review Conference

25. States Parties, with a view to enhance the implementation of the Convention through education of and awareness-raising among life scientists as a preventive measure in the spirit of Article IV of the Convention, could consider:

(a) that the frequent lack of awareness of aspects related to biosecurity and the obligations of the Convention among life scientists has to be addressed more urgently, strategically, and comprehensively;

(b) that these efforts could serve, *inter alia*, as a basis for individual educational and awareness-raising activities by the States Parties on their national level as well as cooperation at an international level;

(c) that such activities could, *inter alia*, lead to the sustainable introduction of specific educational modules and activities related to security aspects of the Convention, also for example as part of an ongoing awareness-raising program;

(d) that the *stakeholders* for such awareness-raising activities and intersessional programmes on dual-use education should involve, *inter alia*, relevant Government Ministries, Industry, Research Institutions, Academia and relevant Scientific Societies in all stages of the design and implementation of oversight frameworks. The *form and nature* of such activities should clearly be developed and implemented by each State Party based of its national rules, regulations and as a complement to its existing outreach activities (i.e. ‘no one size fits all’)

(e) that effective, non-mandatory awareness-raising activities could be developed and implemented, at low cost, containing various concrete measures, including

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<sup>6</sup> See for example: Dando, Malcolm, 2010, *Teaching Biosecurity*, Bulletin of the Atomic Scientists, available: <http://www.thebulletin.org/web-edition/columnists/malcolm-dando/teaching-biosecurity> [viewed 6 January 2011], and: Whitby, Simon and Malcolm Dando, 2010, *Effective implementation of the BWC: The key role of awareness raising and education*, Review Conference Paper No. 26, University of Bradford, available: [http://www.brad.ac.uk/acad/sBWC/briefing/RCP\\_26.pdf](http://www.brad.ac.uk/acad/sBWC/briefing/RCP_26.pdf) [viewed 6 January 2011].

- (i) explaining the risks associated with the potential misuse of the biological sciences and biotechnology;
- (ii) covering the moral and ethical obligations of the Convention incumbent on those using the biological sciences;
- (iii) providing guidance on the types of activities which could be contrary to the aims of the Convention and relevant national laws and regulations and international law;
- (iv) supporting accessible teaching materials, train-the-trainer programmes, seminars, workshops, publications, and audio-visual materials;
- (v) addressing leading scientists and those with responsibility for oversight of research or for evaluation of projects or publications at a senior level, as well as future generations of scientists, with the aim of building a culture of responsibility;
- (vi) integrating the efforts into existing efforts at the international, regional and national levels;

(f) that activities in dual-use education and relevant regulations should not cause unnecessary burdens and do not unduly restrict permitted biological activities. Scientists and all the other stakeholders could prevent the possible misuse of biological science by creating a culture of responsibility and security through biosecurity and bio-ethics education.

(g) that States Parties should inform on their awareness-raising activities on dual-use education in a more explicit manner. (It is recognized that reports on these activities by States Parties could already be included in CBMs under 'Other Measures' in CBM Measure E the 'Declaration of legislation, regulations and other measures' as measures undertaken to ensure effective national implementation of the BWC.) With the publication of this information, *inter alia* in CBM returns, those States Parties which are at a more advanced stage in the implementation of their dual-use awareness-raising and education activities would be able to identify, and offer appropriate cooperation to, States Parties at a less advanced stage in such activities.

(h) that the intersessional period between the Seventh and the Eighth Review Conference should be used for further exchanges and developments of the topic among States Parties as well as States Parties in collaboration with international organisations and non-governmental organisations.

26. The States Parties submitting this Working Paper encourage all States Parties to the BWC to agree on the possible considerations mentioned above in the framework of the Seventh Review Conference.