

Dual-use education for life scientists?

Malcolm DANDO

The Biological and Toxin Weapons Convention (BTWC) is widely understood to be the weakest of the international arms control agreements prohibiting weapons of mass destruction as it lacks both an effective verification system and a major international supporting organization. Following the failure to agree a verification protocol, the 2001–02 Fifth Review Conference of the BTWC moved to consider more tractable issues in the first Intersessional Process of 2003–05. Given the increasing concern that the rapid advances being made in the life sciences for benign civil purposes could also be misused for hostile purposes (the “dual use” problem), the focus of the discussions in 2005 was on codes of conduct for life scientists. It has so far been unclear, however, to what extent this interest in potential dual-use aspects of the life sciences has led to concrete measures, particularly concerning education. This article considers the statements made at BTWC meetings and compares them to the current level of biosecurity education among life scientists.

Following the moderately successful Sixth Review Conference in 2006, a second Intersessional Process was agreed for the period leading up to the Seventh Review Conference in 2011. The topics for discussion and promotion of common understanding and effective action in 2008 were:

- (iii) National, regional and international measures to improve biosafety and biosecurity, including laboratory safety and security of pathogen and toxins;
- (iv) Oversight, education, awareness raising, and adoption and/or development of codes of conduct with the aim of preventing misuse in the context of advances in bio-science and bio-technology research with the potential of use for purposes prohibited by the Convention.¹

The choice of these topics clearly confirms that it is now widely agreed that a web of integrated policies is needed to help prevent bioterrorism and biowarfare,² and that in-depth national implementation of the BTWC, including coverage of the relevant activities of life and associated scientists, is an important element in this web. The Meeting of States Parties to the BTWC in December 2008 was therefore expected to reach a variety of agreements in relation to oversight, education, awareness raising and codes of conduct.

In regard to education for life scientists, paragraphs 26 and 27 of the final report of the December 2008 meeting stated the following:

Malcolm Dando is a Professorial Fellow at the Department of Peace Studies, University of Bradford. This article draws from a paper presented at the International Studies Association Annual Meeting in New York, 2009.

26. States Parties recognised the importance of ensuring that those working in the biological sciences are aware of their obligations under the Convention and relevant national legislation and guidelines, have a clear understanding of the content, purpose and foreseeable social, environmental, health and security consequences of their activities, and are encouraged to take an active role in addressing the threats posed by the potential misuse of biological agents and toxins as weapons, including for bioterrorism. States Parties noted that formal requirements for seminars, modules or courses, *including possible mandatory components*, in relevant scientific and engineering training programmes and continuing professional education could assist in raising awareness and in implementing the Convention.

27. States Parties agreed on the value of education and awareness programmes:

- (i) Explaining the risks associated with the potential misuse of the biological sciences and biotechnology;
- (ii) Covering the moral and ethical obligations 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) Being supported by 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) Being integrated into existing efforts at the international, regional and national levels.³ [emphasis added]

Interestingly, also, in paragraph 31 states parties were encouraged to report steps that they had taken to achieve such objectives to the Seventh Review Conference in order to facilitate decisions on further actions being taken then.

On the face of it, then, this is a very constructive outcome of the Intersessional Process. Those with longer memories of the BTWC will not be as sanguine. As far back as the Second Review Conference of 1986, states parties have noted the importance of education. The Final Declaration of the Fourth Review Conference of 1996 stated, with regard to Article IV on national implementation, “the importance of ... inclusion in textbooks and in medical, scientific and military education programmes of information dealing with the prohibitions and provisions contained in the Biological and Toxin Weapons Convention and the Geneva Protocol of 1925.”⁴

Yet all the evidence available strongly suggests that among life scientists the level of awareness of the BTWC, and of their obligations under the Convention, is extraordinarily low worldwide. For example, we reported to the 2005 BTWC meeting (on codes of conduct for life scientists) on interactive seminars that we had carried out with life scientists at universities.⁵ Our objective was to raise concerns that people involved with security issues had about what was happening in the life sciences—for example the Australian mousepox experiment reported in 2001, which suggested that smallpox might be made resistant to vaccination—and to listen to what life scientists had to say about such concerns. In our report we considered the results of 24 seminars held in the United Kingdom and 1 in Germany. The data were far from encouraging. Indeed, we concluded that:

There was little evidence from our seminars that participants:

- a. regarded bioterrorism or bioweapons as a substantial threat;
- b. considered that developments in the life sciences research contributed to biothreats;

- c. were aware of the current debates and concerns about dual-use research; or
- d. were familiar with the BTWC.⁶

We reported on further work to the Sixth Review Conference in 2006: while the form of the seminar interactions could vary in different countries, the substantive findings were very similar; few life scientists had even heard of the BTWC, let alone given it deep consideration.⁷ We have now carried out some 90 seminars in 13 different countries and we see no reason to alter that conclusion.

A survey of educational provision for life scientists in the European Union carried out at the end of 2008 highlighted the cause of the problem. The authors used the Internet to sample data on 142 courses from 57 universities in 29 countries in Europe. They concluded that:

This research suggested that only 3 out of 57 universities identified currently offered some form of *specific biosecurity module* and in all cases this was optional for students.⁸ [emphasis added]

Additionally, they noted (cautioning that a “reference” could have widely different meanings):

...a total of 37 life science degree courses out of our sample of 142 where there was clear evidence of a reference to biosecurity. Only a minority of the degree courses in the study – a total of 22 out of 142 – made reference to the BTWC, BW and/or arms control and a similar number, 29 degree courses, exhibited some reference to the dual-use issue...⁹

As the authors were easily able to locate many more courses on, and references to, biosafety and bioethics, it seems very likely that their findings reasonably reflect the real situation in Europe and likely in most other regions of the world. Little wonder that life scientists are so ignorant of biosecurity, as it rarely appears in their education!

A number of online modules have been developed recently, particularly in the United States where discussion of the problem of dual use is most advanced, to help scientists inform themselves about the potential hostile misuse of their benignly-intended work. At Bradford, we are collaborating with Japan’s National Defence Medical College in developing an online educational module resource in English and Japanese to help with the development of courses in universities.¹⁰ The problem is that such limited, ad hoc, non-mandatory efforts are very unlikely to make a significant difference to the present pervasive ignorance.

So the situation regarding education and awareness raising among life scientists after the 2008 meetings of the BTWC remains as it was before: until we see effective action by the governments of the states parties to ensure the development of compulsory courses on biosecurity issues for life scientists very little is likely to change.

Given the history of the lack of state action after previous statements of good intentions, therefore, it is necessary to ask what else might be done now to achieve this objective? Clearly, some national academies and scientific organizations are beginning to take the problem seriously,¹¹ and they may be able to encourage foreign ministries, defence ministries and education ministries to work more closely on this issue, but without political attention this may be a long, slow process at a time when development in the life sciences is rapid. So it may be that civil society, through knowledgeable non-governmental organizations, holds the key to effecting change by putting the issue onto the agenda through briefing the media and asking critical questions of parliamentary representatives. A good start might be to ask what national governments are doing to implement the actions described in paragraphs 26 and 27 of the 2008 agreement among BTWC states parties.

Notes

1. Meeting of the States Parties to the BTWC, 2008, *Informal Advance Report of the Meeting of States Parties*, Geneva, United Nations, December.
2. Brian Rappert and Caitriona McLeish (eds), 2007, *A Web of Prevention: Biological Weapons, Life Sciences, and the Governance of Research*, London, Earthscan.
3. Meeting of the States Parties to the BTWC, 2008, op. cit.
4. Fourth Review Conference of the Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, *Final Declaration*, UN document BWC/CONF.IV/9 Part II, Geneva, 1996.
5. Malcolm R. Dando and Brian Rappert, 2005, *Codes of Conduct for the Life Sciences: Some Insights from UK Academia*, Briefing Paper no. 16, Bradford, University of Bradford.
6. Ibid., paragraph 64.
7. Brian Rappert, Marie Chevrier and Malcolm Dando, 2006, *In-depth Implementation of the BTWC: Education and Outreach*, Review Conference Paper no. 18, Bradford, University of Bradford.
8. Giulio Mancini and James Revill, 2008, *Fostering the Biosecurity Norm: Biosecurity Education for the Next Generation of Life Scientists*, Como and Bradford, Landau Network–Centro Volta and University of Bradford.
9. Ibid.
10. M. Minehata et al., 2009, “Developing an Educational Module Resource for Life Sciences through the Biological and Toxin Weapons Convention”, paper presented to the 2nd Biosecurity Symposium, Sydney, Australia, 9–10 February 2009.
11. “FASEB Releases Statement on Dual Use Research and Biosecurity Education”, *FASEB Washington Update*, 5 March 2009, at <opa.faseb.org/pages/WashingtonUpdate/Mar0609/page2.htm#6>.