The Biological Weapons Convention and dual use life science research

Prepared by the Biological Weapons Convention Implementation Support Unit

I. Summary

1. As the winner of a global essay competition for young scientists, Ms Esther Ng from Singapore, noted in her winning entry in 2011:
   “The exponential growth of biomedical technology has brought about unimaginable advances in healthcare, accompanied by unprecedented threats to biosecurity. The maintenance of a safe environment is the shared responsibility of scientists, government officials and members of the public”.

2. The Biological Weapons Convention (BWC) has an important role to play in efforts to manage dual use in the life sciences. As Prof. Indira Nath, a world-renowned immunologist, a prominent member of the InterAcademy Council and recipient of the UNESCO award for Women in Science, noted in her keynote address to the Seventh Review Conference of the BWC in 2011:
   “The BTWC is the legal embodiment of a powerful international norm against the use of disease as a weapon. As a researcher whose career has been devoted to seeking cures for infectious disease, this has great meaning for me. I also believe this norm provides a powerful connection beyond legal requirements to the fundamental social responsibilities of science in ways that can strengthen the implementation of the Convention in the future…. I want to note the important role that the BTWC has played in helping to engage the scientific community, particularly through the Intersessional Process… For most scientists, broad concerns about the social responsibility of science and scientific ethics will be the best entry point for engagement in the specific concerns of the BTWC. Then more can be done to address particular responsibilities vis-à-vis preventing the misuse of science to cause deliberate harm.”

3. The BWC is an international security agreement which places obligations on states to prevent the acquisition of biological weapons. It also obliges states to avoid hampering the pursuit of science and technology for peaceful purposes. It addresses both sides of efforts to manage dual use life science research and requires states to take the necessary national measures. States Parties to the BWC are bound:
   (a) Never under any circumstances to acquire or retain biological weapons
   (b) Not to transfer, or in any way assist, encourage or induce anyone else to acquire or retain biological weapons.
   (c) To take any national measures necessary to prohibit and prevent the acquisition of these weapons; and
   (d) To do all of the above in a way that encourages the peaceful uses of biological science and technology.

4. The BWC is also an increasingly important forum for health security efforts. Over the last decade, work under the BWC has spanned the full spectrum of biological risks. The
linkages between natural, accidental and deliberate disease events have led to better interaction and working relationships between the health, safety and security communities. For example, in 2009, the BWC focused on promoting capacity building in the fields of disease surveillance, detection, diagnosis, and containment of infectious diseases, regardless of cause. In 2010, focus shifted to the provision of assistance and coordination with relevant organizations in the case of alleged use of biological or toxin weapons.

5. The approaches, opportunities and format that yielded results in building bridges between the health and security communities have been ground breaking in strengthening partnership between the security and scientific communities. The important role played by the BWC in bringing the science and security communities closer together has been recognised by the United Nations Secretary-General, leading scientists and national governments.

6. BWC States Parties have already reached numerous agreements and understandings related to the management of dual use life science research across a broad range of areas:

   (a) Oversight of science - including guidance on developing national frameworks and the value of harmonizing them, where possible and appropriate (for examples, see Table 2);

   (b) Laboratory biorisk management - including understandings on terminology in all official languages of the United Nations and guidance on national arrangements (for examples, see Table 3);

   (c) National policies, laws and regulations - including legally and politically binding obligations on the existence of certain national measures; guidance on developing relevant national frameworks as well as their aims and content (for examples, see Table 4);

   (d) Codes of conduct - guidance on the content, adoption and promulgation of codes, roles of various stakeholders as well as the relationship of codes with legislation and regulation (for examples, see Table 1 and Table 2);

   (e) Education and training activities to raise awareness of the risks associated with the malign use of biology - binding commitments to undertake relevant education and outreach activities as well as guidance on the content and conduct of such efforts (for examples, see Table 2).

7. Through the work of the BWC, the international community has already identified a range of advances and activities relevant to discussions over dual use research of concern, including: increased capacity to manipulate the pathogenicity, host-specificity, transmissibility, resistance to drugs, or ability to overcome host immunity to pathogens; to synthesize pathogens and toxins without cultivation of microorganisms or using other natural sources; to identify new mechanisms to disrupt the healthy functioning of humans, animals and plants; and to develop novel means of delivering biological agents and toxins. States Parties are expected to continue to identify relevant advances and activities throughout the 2012-2015 work programme.

8. The current BWC work programme includes a multilaterally agreed, international process to review developments in science and technology that could be used for hostile purposes. It is mandated to review: new science and technology developments that have potential for uses contrary to the provisions of the Convention; new science and technology developments that have potential benefits for the Convention, including those of special relevance to disease surveillance, diagnosis and mitigation; possible measures for strengthening national biological risk management, as appropriate, in research and development involving new science and technology developments of relevance to the Convention; voluntary codes of conduct and other measures to encourage responsible conduct by scientists, academia and industry; education and awareness-raising about risks
and benefits of life sciences and biotechnology; science- and technology-related developments relevant to the activities of multilateral organizations such as the WHO, OIE, FAO, IPPC and OPCW; any other science and technology developments of relevance to the Convention.

9. The BWC work programme is also mandated to foster domestic and international action to build capacity to reduce risks of malign use whilst protecting rights for peaceful use. In 2012, for example, the BWC identified opportunities for maximising benefits from technologies while minimizing risks of their application for prohibited purposes, including, for example, supporting:

   (a) Efforts to ensure the fullest possible exchange of equipment, materials and scientific and technological information and in full conformity with the provisions of the Convention;

   (b) Enhanced national oversight of dual use research of concern without hampering the fullest possible exchange of knowledge and technology for peaceful purposes;

   (c) Continued discussion under the Convention on oversight of dual use research of concern;

   (d) Improved use by relevant national agencies of available sequence and function data;

   (e) Enhanced reference databases to support identification of agents by relevant national agencies; and

   (f) Promotion of the beneficial applications of gene synthesis technologies while ensuring their use is fully consistent with the peaceful object and purpose of the Convention.

10. Meetings of the BWC provide a unique forum bringing together a broad range of stakeholders to discuss issues of direct relevance to managing dual use life science research in a neutral setting, in a flexible format and on a regular basis. Work under the BWC continues to focus on sharing of expertise and experience as well as the identification of best practices.
## APPROACH
- Complement laws and other measures created by states
- Raise awareness of BWC
- Assist scientists in fulfilling legal, regulatory and professional obligations
- Component of national implementation
- Differing national requirements and circumstances necessitates different approaches
- Enable scientists to understand reasonably foreseeable consequences of the work
- Avoid impeding science or international collaboration
- Involve scientists in development, promulgation and adoption
- Apply to all those involved in scientific activity (not just scientists)

## CONTENT
Codes should be:
- Compatible with national laws and regulations
- Simple, clear & easily understood
- Relevant, helpful and effective for guiding decision making
- Broad in scope
- Regularly reviewed, evaluated and revised

## ADOPTION
- Avoid burdensome and duplicative measures
- Demonstrate the benefits of codes
- Encourage scientists to develop their own codes
- Use existing codes, mechanism, frameworks and bodies
- Tailor strategies to needs of each sector

## PROMULGATION
- Most effective if codes and underlying principles are widely known
- Important that purpose of codes is understood
- Continuous efforts through appropriate channels

### TABLE 1: Summary of common understandings on codes of conduct reached at the 2005 BWC Meeting of States Parties

<table>
<thead>
<tr>
<th>OVERSIGHT CHARACTERISTICS</th>
<th>EDUCATION &amp; AWARENESS RAISING COMPONENTS</th>
<th>NEXT STEPS FOR CODES OF CONDUCT</th>
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</thead>
<tbody>
<tr>
<td>Develop national oversight frameworks:</td>
<td>Formal requirements for seminars, modules or courses in relevant scientific education and training programmes and continuing professional education that:</td>
<td>Complement national legislative, regulatory and oversight frameworks</td>
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<tr>
<td>- To prevent agents and toxins being used as weapons</td>
<td>- Explain the risks associated with the malign use of biology</td>
<td>- Help guide science so it is not used for prohibited purposes</td>
</tr>
<tr>
<td>- To oversee relevant people, materials, knowledge and information</td>
<td>- Cover moral and ethical obligations</td>
<td>- Further develop strategies to encourage voluntary adoption of codes</td>
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<tr>
<td>- To oversee the entire scientific life cycle</td>
<td>- Provide guidance on the types of activities which could be prohibited</td>
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<tr>
<td>- To cover private and public sectors</td>
<td>- Are supported by accessible teaching materials, train-the-trainer programmes, seminars, workshops, publications and audio-visual materials</td>
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<td>- That are proportional to risk</td>
<td>- Address leading scientists and managers as well as future generations of scientists</td>
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<td>- That avoid unnecessary burdens</td>
<td>- Can be integrated into existing national, regional and international efforts</td>
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<td>- That are practical and usable</td>
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<td>- That do not unduly restrict permitted activities</td>
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<td>- With the involvement of stakeholders in all stages of design and implementation</td>
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<td>- That can be harmonised regionally and internationally</td>
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### TABLE 2: Summary of common understandings on oversight, education, awareness raising and codes of conduct reached at the 2008 BWC Meeting of States Parties
### COMPONENTS
- Developing national biosafety and biosecurity frameworks
- Defining the role of different national agencies and bodies
- Building national, regional and international networks of relevant stakeholders
- Taking better advantage of assistance already available
- Improving bilateral, regional and international cooperation
- Cooperation and assistance to build relevant capacity
- Enhancing the role played by the Implementation Support Unit

### TOOLS
- Accreditation
- Certification
- Audit or licensing for facilities, organisations or individuals
- Training requirements for staff members
- Mechanisms to check qualifications, expertise and training
- National criteria for relevant activities
- National lists of relevant agents, equipment and other resources

### CHARACTERISTICS
- Measures should:
  - Be practical
  - Be sustainable
  - Be enforceable
  - Be readily understood
  - Be developed with stakeholders
  - Avoid unduly restricting peaceful use
  - Be adapted for local needs
  - Be appropriate for agents being handled
  - Be suitable for work being undertaken
  - Make use of risk assessment, management and communication approaches

### ASSISTANCE NEEDED
- To enact and improve relevant legislation
- To strengthen laboratory infrastructure, technology, security and management
- To conduct courses and provide training
- To help incorporate biosafety and biosecurity into existing efforts to address disease

**TABLE 3:** Summary of common understandings on biosafety and biosecurity reached at the 2008 BWC Meeting of States Parties

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>MECHANISMS</th>
<th>ENFORCEMENT CAPACITY</th>
<th>ONGOING ACTIVITIES</th>
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<tr>
<td>- Sufficient penal legislation for prosecuting prohibited activities</td>
<td>- Promoting cooperation and coordination amongst government agencies</td>
<td>- Building capacity to collect evidence</td>
<td>- Regular reviews of adopted measures</td>
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<td>- Prohibition of assisting, encouraging or inducing others to conduct prohibited activities</td>
<td>- Defining roles of different agencies and bodies</td>
<td>- Developing early warning systems</td>
<td>- Ensuring continued relevance of national measures in light of scientific and technological development</td>
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<td>- Strengthening national capacity (including human and technological resources)</td>
<td>- Raising awareness of BWC amongst relevant stakeholders</td>
<td>- Enhancing coordination between relevant agencies</td>
<td>- Updating lists of agents and equipment</td>
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<td>- Effective export / import controls</td>
<td>- Improving dialogue and communication amongst relevant stakeholders</td>
<td>- Training law enforcement personnel</td>
<td>- Implementing additional measures as required</td>
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<td>- Avoid hampering peaceful use of biological sciences</td>
<td>- Establishing a central body or lead organisation</td>
<td>- Providing enforcement agencies with necessary scientific and technological support</td>
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<td></td>
<td>- Crating a national implementation action plan</td>
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**TABLE 4:** Summary of common understandings on National Implementation reached at the 2007 BWC Meeting of States Parties