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How to address the subnational actor threat and effective national participation in the biological non-proliferation regime

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Abstract

The Biological Weapons Convention (BWC) remains the cornerstone of the biological weapons nonproliferation and disarmament regime, embodying the norm against BW proliferation and a comprehensive BW disarmament obligation. However, the biological weapons threat is evolving due to scientific and technological developments along with increasing subnational actor interest in biological materials for use in criminal and terrorist activities, requiring an assessment of the consequences for the BWC and its future. Several terrorist groups or organizations such as Al Qaeda and its affiliates have displayed a commitment to acquire weapons of mass destruction, including biological

weapons. While expressions of intent, such as Osama Bin Laden's declaration in 1998 that acquiring weapons of mass destruction was a religious duty, as well as attempts to obtain biological agents and conduct experiments for criminal purposes evidence a sustained interest in biological crimes, it remains difficult to assess the actual capacity of non-state actors to conduct a biological attack, especially on a large scale. The 2001 anthrax letters killed 5 people and infected 23 others, but caused widespread disruption and panic, bluntly highlighting the reality of the threat.

Addressing the challenges arising from the subnational actor threat has led to questions about the scope and role of the Convention. BWC

States Parties' efforts through the Convention to strengthen national measures to prohibit and prevent biological weapons are gradually reaping returns, while related intergovernmental organizations in the fields of human, animal and plant health and customs have an indirect positive impact on BWC implementation simply by fulfilling their own mandates. Additional, largely complementary, initiatives have also been developed to focus on the subnational actor threat, particularly bioterrorism. The involvement of civil society in prevention is also a key issue. The BWC Seventh Review Conference from 5-22 December 2011 is an opportunity to review the state of the biological weapons regime, its national implementation by states and, crucially, what role the BWC should play in the near-, mid- and long-term in driving the BW nonproliferation and disarmament agenda.

Introduction

The technological revolution in the life sciences has generated novel opportunities for biological weapons (BW) proliferation by both state and subnational actors. The threat of subnational actors engaging in prohibited activities involving biological agents and toxins—biological weapons activities—is certainly not new, yet States Parties to the 1972 Biological Weapons Convention (BWC) have only relatively recently turned their attention from focusing on state biological weapons disarmament and non-proliferation (particularly through the development of a protocol to strengthen compliance with the Convention), to considering how to address the subnational BW threat in their own—and others'—backyard. This paper focuses on the prevention of the subnational proliferation threat and does not address consequence management issues.

The BWC has been criticized as not explicitly addressing the challenge of subnational BW proliferation in the treaty text, yet its prohibitions are universal and States Parties are required under Article IV to adopt 'any necessary measures' to give effect to them at the national level. The types of national measures needed to prohibit and prevent biological weapons proliferation (both deliberate and inadvertent) by subnational actors are well understood, yet their precise combination to effectively achieve this objective in any given state is not. No 'one size fits all' approach to national implementation of the BWC exists. Even so, many states have thus far failed to give effect to their BWC obligations, as is evidenced by the lack of even criminal sanctions for BW crimes. Adoption of biosafety and biosecurity measures remains equally wanting. As states

grapple with these problems, concerns about implementation resource constraints and perceived regulatory barriers to legitimate trade and development, as well as debates about the precise locus of the BW threat inevitably arise. Complementary initiatives that address each component of the biological risk spectrum abound, but are those which focus ostensibly on CBRN threats, including bioterrorist threats—notably United Nations Security Council Resolution 1540 (2004)—more competitive, or duplicative, than complementary?

The concepts of subnational or non-state actor generate definitional problems when applied in the BW field, as the arms control discourse commonly adds a negative connotation as a consequence of its focus on the threats of armament, proliferation and use. It rarely uses them in their broader, neutral meaning to imply any entity in international relations which is not a sovereign state¹, including academe, non-governmental organizations and faith groups within civil society, the private sector or economic and social partners. Yet many of these entities perform vital functions in upholding arms control, alongside state and intergovernmental actors, and ought to be better integrated into the respective regimes, especially their implementation, monitoring and oversight functions.

Universally recognized as the cornerstone of the biological weapons regime, the Biological Weapons Convention has a quinquennial opportunity to drive the BW disarmament and nonproliferation agenda for the next five-year period and beyond, and to reconsider how it can improve effective national participation in the Convention and effectively respond to the subnational actor threat, including *inter alia*, bioterrorism, at its Seventh Review Conference from 5 to 22 December 2011.

The revolution in the life sciences and its impact on national implementation of the BWC

Scientific and technical developments in life sciences in areas such as bioinformatics, genomics, proteomics, and synthetic and systems biology contribute to innovations and offer great perspectives, for example for the production of pharmaceutical products or of renewable energy². However the risk of misuse, while difficult to assess, persists³.

DNA shuffling, relying on *in vitro* recombination of homologous genes, is a powerful process for directed evolution that generates faster numerous recombinants, which can then be translated

into proteins. It could contribute to the design of harmful agents, especially if coupled with screening techniques enabling the selection of molecules with specific properties. Media coverage also regularly focuses on the results obtained in the field of synthetic genomics and synthetic biology, as threat genes or even genomes could be produced by DNA synthesis for malevolent purposes. Achievements like synthesis of a virus with the biochemical and pathogenic characteristics of a poliovirus, reconstruction of the 1918 Spanish influenza pandemic virus or synthesis of a *Mycoplasma genitalium* genome have sparked controversies. Synthetic biology can be described as the engineering of new components and systems that do not exist in nature, as well as the redesign of existing natural biological systems. It incorporates elements from other disciplines, exploits technologies in bioinformatics, reverse genetic engineering and DNA synthesis. It highlights some of the main challenges the BWC has to face. These new trends in life sciences, as well as in related technologies and industrial applications, with their dual-use potential for benign and weapon purposes, have direct implications for the BWC⁴.

One of them is the growing convergence between various disciplines, and especially between biology and chemistry. This calls for increasing linkages between the BWC and CWC regimes and the respective activities taken to implement them at the domestic level. These Conventions pose similar national implementation challenges, particularly with respect to subnational actors. Professionals from various disciplines can be involved, meaning people who may be even less aware of the potential for misuse can be engaged in dual-use science relevant to these Conventions⁵.

Moreover, misuse could occur in various types of facilities, including pharmaceutical and biotechnology companies, private research laboratories, as well as university and hospital laboratories. The pharmaceutical sector is a highly dynamic and expanding industry as a result of the competition with generic manufacturers, the development of biotechnologies, the potential markets resulting from national and international biodefense programs or preparedness against emerging diseases. As a consequence, more individuals are acquiring the skills and expertise to handle highly pathogenic materials, and the risk of a miscreant scientist or professional increases accordingly.

The BWC community has launched a debate about suitable governance models for the dual-use technologies and applications⁶: regulatory frameworks; self-governance approaches involv-

ing education and awareness-raising among relevant scientific and professional groupings to create a culture of responsibility; and hybrid models combining these different approaches. These models tend to presume some structural organization within the target groups which can be exploited to check their behavior.

But a new category of non-state actor, commonly known as “bio-hackers”, pursue genetic engineering “outside traditional professional settings” that support governance and oversight. They are amateurs who seek to practice biology without malignant intent. In the United States, for example, the members of Genspace consider themselves the first non-lucrative community biological laboratory and wish to promote science as a leisure activity for both adults and children. The bio-hackers can find information on dedicated websites such as OpenWetWare.org and discuss their activities on forums such as DIYbio.org. Despite their sometimes advanced knowledge of biology, most members of the bio-hacking community lack sufficient awareness of the risks they may pose to themselves or the environment, and consequently of the biosafety and biosecurity implications of their activities. These activities presently remain under-regulated and without adequate oversight in virtually all countries. Furthermore, given their essentially anarchic organizational structure, others with malignant intent could easily exploit their network, results and methods. These initiatives have thus caused uneasiness and fear of accidental release or misuse of pathogenic agents or toxins, although efforts are underway to mitigate such risks. For example, the FBI seized the opportunity to develop closer links between science and security communities through outreach activities, organizing meetings gathering public and private sector researchers with representatives from the security community. It is hoped that raising awareness about the risks involved, will better inform participants of what action to take if they encounter suspicious activities^{7, 8}.

The scope of BWC national implementation

The increased risk of BW proliferation from these scientific and technical developments in the life sciences has generated spirited debate about the adequacy of the BWC as a regulatory instrument to address the subnational actor threat. While the BWC was devised to disarm state-run biological weapon programs, it equally sought to prevent any future biological armament. Founded on the ‘general purpose crite-

tion', Article I of the convention covers all current and future threats posed by biological agents and toxins, irrespective of whether they occur naturally or are created artificially in laboratories. States Parties are cognizant of the rapid advances in the life sciences and update their understanding of the scope of the Article I prohibition in light of these developments at Convention review conferences: the next intersessional process is expected to consider such developments more frequently. Article III further evidences that the BWC ban on BW proliferation covers subnational actors, by prohibiting States Parties from transferring biological and toxin agents, weapons and delivery systems to 'any recipient whatsoever', a clause understood to encompass non-state actors.

The bioterrorism discourse posits that while the BWC covers this particular threat, it lacks adequate tools to address it in a high threat environment and does not demand sufficiently detailed national implementation to effectively prevent it. Consequently, much political effort has been invested in parallel instruments and initiatives to 'beef up' the regime against BW, such as, for example, UN Security Council Resolution 1540. While such additional layers undoubtedly contribute to the global coverage of certain BW prohibitions (the BWC still lacks universality), the question arises whether these related initiatives do not undermine the role of the BWC as cornerstone of the biological weapons regime or whether, on the contrary, they actually reinforce the regime by explicating some obligations and international expectations to prevent biological weapons. Those parallel initiatives focus almost exclusively on subnational BW threats, particularly bioterrorism, seemingly to the exclusion of tangible state-based BW threats.

Yet the BWC's strength lies in its simplicity and comprehensive scope. Article I, with the so-called general purpose criterion, defines the scope of prohibitions; in essence, never under any circumstances to acquire or retain biological weapons. A related paragraph in the Final Declaration of the Sixth Review Conference (2006) states that "the Conference reaffirms that Article I applies to all scientific and technological developments in the life sciences and in other fields of science relevant to the Convention⁹."

As noted earlier, Article III addresses the threat from subnational actors. The final declaration at the Fourth Review Conference (1996) urges states parties to consider "ways and means to ensure that individual or subnational groups are effectively prevented from acquiring, through transfers, biological agents and toxins for other than peaceful purposes¹⁰."

Article IV obliges states to take "any necessary measures" to prohibit and prevent proliferation of biological weapons, "within [their] territory, under [their] jurisdiction or under [their] control anywhere", which implies legislation and regulation (to give effect to prohibitions), but also other measures such as national policies, physical protection activities, training of personnel and law enforcement. The scope of such national measures clearly intends to cover states as well as subnational actors. However, great disparities still characterize the implementation of these obligations, a situation that the supplementary set of obligations in UNSC Resolution 1540 has not been able to ameliorate given its patchy effectuation and the need to educate and engage BWC non-States Parties in BW non-proliferation discourse. Admittedly, lack of BWC universality negatively affects the qualitative and quantitative nature of BW-relevant laws worldwide. This is a cause for concern, because many companies involved in biotechnology research and DNA synthesis operate in countries that are not party to the BWC or have a less than satisfactory legislative and regulatory framework.

National implementation transposes the first four articles of the BWC into the national legislative and regulatory frameworks and facilitates other obligations, such as international cooperation and assistance in the event of BW use (Article VII) and the collation and submission of information under the CBM data-exchange mechanism. The measures seek to penalize prohibited activities, establish requirements to control the transfer (import, export, transit and transshipment) of dual-use biological materials and technologies, as well as specify requirements for the safe and secure handling, transportation and use of particularly dangerous biological agents and toxins, and establish personnel reliability checks to reduce subnational threats. Such biosecurity legislation primarily regulates capabilities due to the technical difficulties in determining intent when dual-use biological agents, equipment and technologies are involved. However, some countries have criminalized statement of terrorist intent, incitement, recruitment, or training, as well as of financing terrorism, including biological terrorism¹¹. States may also establish strict liability offences for the possession of certain dangerous pathogens and toxins without authorization, for which intent need not be proved. The use of the internet as a means of propaganda, for spreading hate speeches, communicating, sharing knowledge or raising funds poses new types of challenges, and initiatives to either shut down or monitor websites of particular concern have been launched¹².

States Parties can usefully enhance national and collective procedures to review the effectiveness of their national measures to implement the Convention, for example by designating a national agency with BWC implementation and enforcement responsibilities and discussing national implementation issues annually during the intersessional process. Establishing a national BWC focal point, as recommended by the Sixth Review Conference, will also improve interaction between States Parties and among the wider BWC network, to promote improved national implementation and to facilitate implementation assistance. The BWC Implementation Support Unit (ISU) has initiated outreach activities, including utilizing electronic media for cost efficiencies, but the national focal points will have a crucial role in taking the BWC out of Geneva, the locus of its intersessional and review conference meetings, to State capitals and regional hubs for ongoing, detailed discussion on implementation issues, including regional approaches and harmonization, and assistance provision. Civil society groups are well-placed to help bridge the geographic gap between Geneva and State capitals and the communication “discourse” gap between officials and other BWC stakeholder groups. In this way, subnational actors are also a necessary part of the solution to the modern BW proliferation challenges.

A number of non-governmental organizations and academic groups are actively engaged with States Parties, the BWC ISU and other assistance coordinators in providing practical, technical support across the national implementation obligations and in raising awareness of the range of implementation obligations, resulting in productive co-operative arrangements. For example, Bradford University in the United Kingdom conducts training in bioethics and has developed a comprehensive educational module on biosecurity and dual-use issues¹³. VERTIC, a London-based non-governmental organization, provides technical legislative assistance for BWC ratification and accession and drafting implementing laws and regulations. It has developed a comprehensive BWC legislation toolkit comprising sample acts, regulatory guidelines and a range of fact sheets in a range of languages and it maintains a free online database of BW-related laws as exemplar approaches for other states and to enhance transparency over national implementation¹⁴. Its lawyers have worked with countries in each geographic region, at their request, to develop BWC implementing laws and cooperated with international and regional organization partners to promote legislative obligations and provide a tailored legislative assistance package.

VERTIC’s technical, professional and confidential approach has eased its integration into the BWC regime and is a possible model for further collaborative partnerships to strengthen BWC regime development in the future.

States Parties have acknowledged the value of civil society involvement in the Convention’s operation only relatively recently, as evidenced by invitations to participate in national and regional BWC-related workshops, their increasing attendance at civil society side events at BWC meetings and, most notably, their acceptance of civil society badge-holders in working sessions during Convention meetings in Geneva, an explicit recognition that they too are partners in BWC implementation. Notwithstanding these positive, albeit incremental developments, addressing the biological threat posed by sub-state actors worldwide will require sustained levels of interest and political engagement in the BWC and financial and material support for national implementation in countries suffering from a paucity of fiscal and human resources in certain geographic regions.

Conceptual challenges for the BWC in addressing the subnational actor threat

The BWC faces a tremendous challenge due to the dual-use dilemma. There are many legitimate applications for dual-use biological materials and the distinction between prohibited and legitimate activities may be blurred. It is far more difficult to control purposes than to control agents and equipment. Furthermore, bioterrorism threat assessment also involves ascertaining capability and intent. Assessing *capability* is theoretically the easier of both as holdings of dangerous pathogens, possession of critical equipment and personnel with required knowledge and expertise can be objectively established. In practice, however, it poses significant hurdles because maintaining detailed oversight over agent collections and access to them is extremely difficult and, at a national level, dependent on the rigorous enforcement of a range of biosafety and biosecurity measures. Assessing the (malicious) *intent* of subnational actors is substantially more complex. Non-coercive approaches developed against terrorism seek to better understand motivation and intention in order to devise effective policies and practices for prevention, for example, by means of deradicalization programs¹⁵. They rely in part on a dialogue using ideological and theological arguments, with the objective of de-legitimizing the use of violence and countering extremist ideolo-

gies¹⁶. While they do not focus on means of attack terrorists have or would have used, some arguments against bioterrorism could derive directly from the specific nature of biological weapons. However the BWC is not the relevant framework to develop such programs.

Western states viewed the traditional approach to non-proliferation as too narrow, given the dual-use dimension of the agents and equipment in relation to the subnational actors' threat, and they devised a model relying on a network of measures¹⁷, consisting of, among other things, the Proliferation Security Initiative (PSI), the Container Security Initiative (CSI) and the G8 Global Partnership. The UN Secretary General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons also received increased attention. Resolution 1540 targets the terrorist threat most specifically.

The UN Security Council adopted Resolution 1540 on April 28, 2004, under Chapter VII of the United Nations Charter and extended the mandate of its monitoring body, the 1540 Committee, for fixed periods through Resolutions 1673 (2006), 1810 (2008) and 1977 (2011). As Security Council decisions are binding on all UN member states, Resolution 1540 requires all states to refrain from providing any form of support to non-state actors that attempt to develop, acquire, manufacture, possess, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery. With respect to BW, the resolution reiterates the prohibitions of the first three articles of the BWC, but effectively extends them to UN member states not party to the BWC. Furthermore, Operative Paragraph 3 of the resolution obliges states to *take* and *enforce* "effective measures," an incremental development on BWC Article IV, which simply requires States Parties to "take any necessary measures". Arguably, Resolution 1540 provides specificity of the types of measures "necessary" to give effect to the BWC, although it neatly dodges the issue of vertical and horizontal state proliferation¹⁸. While the resolution does not generate new obligations (except for states outside the BWC), it gave new impetus to the enhancement of BW national measures and their international monitoring by a UN Security Council committee. Resolution 1540 has also had a major impact on the agenda of the BWC inter-*sessional* meetings, held between review conferences, and on the development of specific assistance programs and marshalling of assistance resources, which assess and, where needed, help to ameliorate existing legislation.

The BWC Sixth Review Conference recognized the synergistic rather than competing relation-

ship between the Convention and Resolution 1540 when it recognized "the contribution of full and effective implementation of United Nations Security Council Resolution 1540 by all states to assist in achieving the objectives of this Convention¹⁹," while the Resolution promotes "the universal adoption and full implementation, and, where necessary, strengthening of multilateral treaties to which they are parties²⁰." It is thus necessary to ensure cooperation and coordination between the two international legal instruments, as they both support capacity-building, contribute to education and awareness-raising through outreach activities and require analogous legislative development.

An alternative approach considers risk management principles to counter the threat posed by non-state actors armed with BW. The 2009 US National Strategy for Countering Biological Threat, for example, states that "a comprehensive and integrated approach is needed to prevent the full spectrum of biological threats as actions will vary in their effectiveness against specific threat²¹." Regarding disease surveillance, detection, diagnosis and containment, the parties to the BWC considered during the 2007-2011 inter-*sessional* process the contribution of international organizations such as the World Health Organization (WHO), the Food and Agriculture Organization (FAO), and the World Organisation for Animal Health (OIE) to enhancing the prohibition against BW and threat prevention. While the day-to-day activities of these organizations are peripheral to the BWC, their global efforts at capacity-building in disease prevention are relevant if the range of biological outbreaks from natural disease to deliberate release of pathogens is considered as a single risk spectrum. In this regard, the International Health Regulations (IHR 2005), legal agreement binding 194 countries, including all 193 member states of the WHO plus the Holy See²², defines "core capacity requirements for surveillance and response" and requires notification of all public health events which may constitute a public health emergency of international concern.

Presently the enhancement of disease surveillance mechanisms and response capacity to address infectious diseases outbreaks also drive the debate about Article X of the Convention. For many decades this article represented a fault line between the industrialized, who emphasized disarmament and non-proliferation (as contained in Articles I and III), and many developing countries, who wanted to see the development promise fulfilled. It stipulates that member states, *inter alia*, have to "facilitate and have the right to participate in, the fullest exchange of equipment,

materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes.” The BWC is another forum for the exchange of information about disease detection and response. States Parties seem to discuss in parallel the appropriate means of implementing Article X, on the one hand, and satisfactory demonstration of such implementation, on the other hand. Thus, some countries, especially from the Non-Aligned Movement (NAM), call for an increased international cooperation and sharing of life sciences research outcomes and technology²³, while the Western European and Others Group (WEOG) countries repeatedly list their funding initiatives, training and capacity-building activities, and biosafety, biosecurity and technology transfer projects with developing country partners. Nascent calls for improved commitment to achieving the nonproliferation goals of the Convention, particularly with regard to the bioterrorist threat as a *quid pro quo* for receiving such assistance, will grow.

The BWC lacks an international organization to oversee its implementation. Therefore, over the past decade, some States Parties and independent analysts suggested to co-opt related intergovernmental organizations to serve particular functions. The proposals proved politically extremely delicate and the international organizations rebuffed them. The WHO’s support to its member states in strengthening public health infrastructure clearly benefits the BWC regime, but attempts to adapt those mechanisms into tools for investigating suspicious outbreaks of disease (which may involve allegations of BW use, and non-compliance with the Convention) on the grounds that the WHO has the relevant skills and procedures for discerning disease epidemiology, have appropriately failed *ab initio* as such responsibility could risk the WHO’s impartiality when fulfilling its own mandate²⁴.

Industry associations and scientific societies clearly have a significant role to play in the interface between health and security and over the past years they have become increasingly involved in the discussions on preventing deliberate release and have developed a stake in the future of the BWC. Growing awareness of the dual-use potential of many of their activities as well as nascent appreciation of the security risks inherent in genetic engineering, synthetic biology and other emerging fields (including bionanotechnology), they have begun investing heavily in addressing concerns relevant to the BWC²⁵. These associations and societies represent a forum for an open debate about issues such as ways and means to strengthen biosecurity and

promotion of exchanges of best practices. They can contribute to raising awareness among their respective communities about the threat of biological weapon proliferation and the risks resulting from the misuse of knowledge, as well as of dual-use goods and technologies. They can provide to their members information about the BWC. States Parties should also involve them more narrowly in the future of Convention, and draw on their specialist resources, for instance, to the review of scientific and technological developments. However, the long-term commitment of these national and transnational stakeholders to the prevention of BW remains a major question mark.

A vision of the BWC’s future

Strengthening the BWC as the cornerstone of the regime against biological weapons, requires a common vision on the future role of the treaty and the possible roles of its prohibitions on the subnational level. Concomitantly, it must reflect upon the roles of other international organizations, taking into account their own mandates. Overstepping those mandates and blurring borders between security and health issues may prove counterproductive for the objectives of the BWC in the long-term.

A range of actors is now engaged in the biological weapons regime, some of which are specifically involved in analyzing and devising responses to the BW threat from subnational actors. In a network model of governance, non-governmental organizations and other civil society stakeholders should assume greater responsibility and apply their specific capacity and expertise to launch awareness-raising and assistance initiatives. They can engage more efficiently both state and non-state actors, some of whom would otherwise not have been aware of the BW threat, the preventive means, and implementation requirements.

In the near-term, the Seventh Review Conference could usefully involve such individuals and entities in its deliberations during open sessions and resolve to improve the coordination, communication and, admittedly somewhat politically-sensitive, integration of relevant actors into the BWC regime. This proposal would partly fulfill the wish expressed by a number of delegations to bring the illuminating civil society presentations and discussions from the side events into the official Conference meetings. Many specialist civil society groups, including industry and professional organizations, are currently under-utilized and should be better integrated into outreach and national implementation processes.

The Seventh Review Conference should also agree for the next intersessional process to consider national implementation issues annually, to keep abreast of challenges (including those posed by scientific and technical developments and the subnational actor threat) but also trends in effective national implementation (especially in biosecurity and biosafety), and to sustain the interest of new subnational actors who can constructively input to this process. This *ad hoc* approach to strengthening mechanisms for improving national implementation would build on the modest, incremental developments achieved during the 2007-2010 intersessional process (improved civil society access to Convention meetings, broadcasts of open sessions, enhanced transparency of official documents on the ISU website) and should hold particular appeal for states that remain reluctant to develop a BWC oversight organization. In fact, the tide of civil society involvement in BWC processes in Geneva, state capitals and regions has gained such momentum that its continuation in some form is inevitable. The Seventh Review Conference must also ensure that the BWC ISU is sufficiently resourced to facilitate effective coordination between this range of BWC stakeholders in the next intersessional period. Improving transparency over the status and effectiveness of national implementation, including enforcement, would also contribute to addressing the subnational actor threat. Iris Hunger and Guo Anfeng thus propose an expansion of the CBM data exchange procedure and for a database of national implementing measures (such as VERTIC has already made available), including legislation and other relevant initiatives, to ameliorate this information lacuna²⁶.

Addressing sub-par implementing legislation goes some way to addressing the subnational actor threat, but other significant national implementation challenges remain, notably raising awareness and building capacity for effective biosecurity and biosafety, including education on biorisks and bioethics for life scientists. While significant initiatives are operating, their sustainability is questionable. The Seventh Review

Conference must also consider how to incorporate these other elements of effective national implementation into the regime's workings. In the near-term, a workshop could be dedicated to exploring how to strengthen articles V, VI and VII, on consultation and investigations concerning compliance concerns and providing assistance to States Parties affected by a BWC violation respectively, with a view to mitigating the effects of a biological terrorist attack, or even deterring it. States Parties and expert partners could also usefully consider, on an ongoing basis, what constitutes an effective mechanism, or set of mechanisms, for monitoring and reviewing compliance and investigating credible and substantiated suspicions of non-compliance in order to suppress and address the sub-national actor threat.

To go further, the issue of verification should be reassessed in the mid- and long-terms, taking into account subnational threats and national measures. Verification relying on a legally-binding mechanism remains a divisive issue among States Parties. But should such a mechanism or other alternatives be negotiated, States would need to consider whether or how it could contribute to the prevention of subnational threats. State Parties disagreeing with the verification approach argue that it would be very complex to verify the accuracy of declarations related to dual-use facilities²⁷. Beyond the scientific and technical difficulties to define an effective verification mechanism, it would also require allocating sufficient financial and human resources.

While there remain differing views among States Parties on the verification techniques and level of intrusiveness required of a BWC verification system, national enforcement involving monitoring and inspections is necessary and, arguably, feasible as demonstrated by those states which currently oversee such systems. Again in the near-term, the BWC should endorse and provide substantive support to States Parties to instigate such national enforcement regimes, taking whatever decisions may be necessary to support and sustain them. ♦

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Notes

1. Gáspár Biro and Antoanella-Iulia Motoc, "Working Paper on Human Rights and non-States Actors", E/CN.4/Sub.2/2005/40, July 11, 2005.
2. Alexander Kelle, Kathryn Nixdorff, and Malcolm Dando, "Sciences et technologies en rapport avec la Convention sur l'interdiction des armes biologiques", *Sécurité globale* 17 (2011), pp 133-147.
3. Terence Taylor, "Safeguarding advances in the life sciences: The International Council for the Life Sciences is committed to becoming the authoritative source for identifying and managing biological risks", *EMBO Reports* 7 (July 2006), pp. S61-S64.
4. Caitríona McLeish and Ralf Trapp, "The Life Sciences revolution and the BWC", *Non Proliferation Review* 18 (2011), pp. 527-543.
5. Malcolm Dando, "Dual-use education for life scientists?", *Disarmament forum* 2 (2009), pp.41-44.
6. Caitríona McLeish and Paul Nightingale, "Biosecurity, bioterrorism and the governance of science: the increasing convergence of science and security", *Research Policy* 36 (December 2007), pp. 1635-1654.
7. Gaymon Bennett, Nils Gilman, Anthony Stavrianakis and Paul Rabinow, "From synthetic biology to biohacking: are we prepared?", *Nature Biotechnology* 27 (2009), pp. 1109-1111.
8. Science, Law Enforcement Build Bridges, *Science* 330 (2010). P. 1767.
9. Sixth 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: Final Document (BWC/CONF.VI/6), 2006.
10. Fourth 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: Final Document (BWC/CONF.V/17), 2002.
11. Alec Walen, "Criminalizing Statements of Terrorist Intent: How to Understand the Law Governing Terrorist Threats, and Why it Should be Used instead of Long-Term Preventive Detention", *Journal of Criminal Law and Criminology* (2011, forthcoming).
12. CTITF Working Group on Radicalisation and Extremism that Lead to Terrorism, "First Report of the Working Group on Radicalization and extremism that lead to terrorism: Inventory of State programmes", 2008.
13. Bradford Disarmament Research Centre, Bradford University, United Kingdom 'Educational Resource Module'.
14. Verification Research, Training and Information Centre (VERTIC), 'BWC National Implementing Measures Database', www.vertic.org. VERTIC also provides legislative assistance for the CWC and, from 2012, the biological, chemical and nuclear weapons-related obligations under UNSCR 1540.
15. Arie W. Kruglanski and Shira Fishman, "Psychological factors in terrorism and counterterrorism: individual, group, and organizational levels of analysis", *Social Issues and Policy Review* 3 (2009), pp. 1-44.
16. John Horgan and Kurt Braddock, "Rehabilitating the Terrorists?: challenges in assessing the Effectiveness of De-Radicalization Programs", *Terrorism and Political Violence* 22 (2010), pp. 267-291.
17. Piers Millett, "The Biological Weapons Convention: Securing Biology in the Twenty-first Century", *Journal of Conflict and Security Law* (2010).
18. Angela Woodward, "The Biological Weapons Convention and UNSCR 1540", *Global Non-Proliferation and Counter-Terrorism: The Impact of United Nations Security Council Resolution 1540*, Olivia Bosch and Peter van Ham(editors), Brookings Institution Press, Washington, D.C., 2007, pp. 96-112.
19. Sixth 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: Final Document (BWC/CONF.VI/6), 2006. p 8.
20. Paragraph 8. Resolution (1540) adopted by the Security Council at its 4956th meeting, on 28 April 2004. S/RES/1540 (2004).
21. National Strategy for countering biological threats (November 2009), p. 3.
http://www.whitehouse.gov/sites/default/files/National_Strategy_for_Counteracting_BioThreats.pdf
22. State Parties to the International Health Regulations (2005).
http://www.who.int/ihr/legal_issues/states_parties/en/index.html
23. Kirk Bansak, "Issues Develop as BWC Review Approaches", *Arms Control Today* (January / February 2011).
24. Christian Enemark, "The Role of the Biological Weapons Convention in Disease Surveillance and Response", *Health Policy and Planning* 25 (2010), p. 486.
25. Gary Burns, Karen Byers, Teck Mean Chua, Heather Sheeley and Brad Goble, "Biosafety professionals as stakeholders in the BTWC", *Disarmament Forum* 1 (2011), pp. 27-38.
26. Iris Hunger and Shen Dingli, "Revisiting and Reviving the BWC's Confidence-Building Measures", *Non Proliferation Review* 18 (2011), pp. 513-523.
27. Jez Littlewood, "The Verification Debate in the Biological Weapons and Toxin Convention in 2011", *Disarmament Forum*, No 3 (2010), p. 17.

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