



Biological Weapons Convention

Report on National Implementing Legislation

National Implementation Measures Programme

November 2016

Cover image: This illustration depicts a photomicrographic view of a culture specimen revealing the presence of numerous Gram-positive *Clostridium botulinum*, formerly known as *Bacillus botulinus* bacteria, and bacterial endospores. © US Centers for Disease Control

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Credits

About VERTIC

The Verification Research, Training and Information Centre is an independent, not-for-profit non-governmental organization. Our mission is to support the development, implementation and effectiveness of international agreements and related regional and national initiatives. We focus on agreements and initiatives in the areas of arms control, disarmament and the environment, with particular attention to issues of monitoring, review and verification.

VERTIC conducts research and analysis and provides expert advice and information to governments and other stakeholders. We also provide support through capacity building, training, legislative assistance and cooperation.

We engage closely with governments, policy-makers and international organizations, as well as with the private sector and technical, academic and non-governmental communities worldwide.

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About this report

This report draws on VERTIC's legislative analysis and assistance experience to provide a snapshot of the current status of Biological Weapons Convention (BWC) implementing legislation and identify some implementation trends. It provides an assessment of the status of BWC States Parties' national implementing legislation, adopted pursuant to Articles III and IV of the Convention, and related provisions in UN Security Council Resolution 1540 (2004), at the occasion of the Eighth BWC Review Conference and serves as a baseline analysis against which progress may be measured in the next BWC intersessional process.

This report does not address national implementation matters beyond the scope of Articles III and IV nor does it attempt to curate or assess the copious proposals tabled in BWC meetings and related forums during this BWC intersessional period concerning national implementation. Rather, the report focuses on the discrete issue of implementing legislation and documents VERTIC's insights of working 'at the coal face' of legislative assistance.

1. Introduction

1.1 VERTIC's role in BWC national implementing legislation

VERTIC has been engaged in systematic analysis of States Parties' implementing legislation for the 1972 Biological Weapons Convention since 2002, when the issue first gained serious traction in BWC diplomacy following the collapse of the verification protocol negotiations.¹ Seeing a need for awareness-raising of the mandatory obligation, in Article IV, to adopt and enforce national implementing measures for the Convention, and for the provision of BWC-specific legislative assistance, especially tailored legislative drafting support, VERTIC devised projects to do just that. In addition to providing assistance to State officials to help them to review, revise and draft new implementing measures, VERTIC has also developed a suite of legislative assistance tools, which are updated periodically in response to developments in best practice.

VERTIC has provided this support for over a decade now, both through its own projects and as invited experts to assistance initiatives coordinated by States, and regional and international organisations, including the European Union's Biological Weapons Convention Council Decisions and CBRN Risk Mitigation Centres of Excellence Initiative.

As a result of conducting this highly specialized legislative assistance work – not just for the BWC but increasingly across chemical, biological, radiological and nuclear (CBRN) obligations, particularly those arising under UN Security Council Resolution 1540 (2004) – VERTIC has developed a unique understanding of States' approaches to implementing the Convention, of the status of BWC national implementing measures, both presently and their incremental development since 2002, and of what constitutes effective practice. Through our engagement with over 145 States all over the world and our participation in diplomatic and other technical BWC-related processes, we have also gained a good appreciation of the challenges in ensuring effective national implementation of the Convention.

1.2 VERTIC's survey methodology and purpose

VERTIC developed a survey template compiling elements of national implementing measures which are necessary to fulfil Articles III and IV of the Convention and the biological weapons-related requirements of UN Security Council Resolution (UNSCR) 1540 (2004), which also applies to all BWC States Parties. The UNSCR obligations reinforce and further expound those national implementation obligations in the BWC which relate to non-proliferation of biological weapons to non-State actors.² We have translated the survey template into Arabic, Dutch, French, Georgian, Portuguese, Spanish and Turkish to enable us to complete surveys of legislative measures for countries using these languages.

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1 See Trevor Findlay, 'Bush ditches the BW Protocol', *Trust & Verify*, Issue No. 98, July–August 2001 pp 1–3.

2 See Angela Woodward, 'The Biological Weapons Convention and UNSCR 1540' in *Global Non-Proliferation and Counter-Terrorism, The Impact of UNSCR 1540*, Olivia Bosch and Peter van Ham (editors), Brookings Institution Press, 2007

Box 1 National implementation obligations

The 1972 Biological Weapons Convention (BWC) comprehensively prohibits the development, production, acquisition, transfer, retention, stockpiling and use of biological and toxin weapons (hereafter in this report 'biological weapons'). As biological weapons are composed of, made and delivered by dual-use materials, they are defined based on their purpose, using a 'General Purpose Criterion' formulation in Article I:

'(1) microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;

(2) weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.'

Under Article IV of the Convention, each State Party is obliged:

'... in accordance with its constitutional processes, [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.'

Under Article III of the Convention:

'Each State Party to this Convention undertakes not to transfer to any recipient whatsoever, directly or indirectly, and not in any way to assist, encourage, or induce any State, group of States or international organisations to manufacture or otherwise acquire any of the agents, toxins, weapons, equipment or means of delivery specified in Article I of the Convention.'

Further, all States, whether or not they have adhered to the BWC, are obliged under UN Security Council Resolution 1540 (2004) to:

under Operational Paragraph 2 *'... in accordance with their national procedures, [to] adopt and enforce appropriate effective laws which prohibit any non-State actor to manufacture, acquire, possess, develop, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery, in particular for terrorist purposes, as well as attempts to engage in any of the foregoing activities, participate in them as an accomplice, assist or finance them;'*

under Operational Paragraph 3 *'... take and enforce effective measures to establish domestic controls to prevent the proliferation of nuclear, chemical, or biological weapons and their means of delivery, including by establishing appropriate controls over related materials and to this end shall:*

- (a) Develop and maintain appropriate effective measures to account for and secure such items in production, use, storage or transport;
- (b) Develop and maintain appropriate effective physical protection measures;
- (c) Develop and maintain appropriate effective border controls and law enforcement efforts to detect, deter, prevent and combat, including through international cooperation when necessary, the illicit trafficking and brokering in such items in accordance with their national legal authorities and legislation and consistent with international law;
- (d) Establish, develop, review and maintain appropriate effective national export and trans-shipment controls over such items, including appropriate laws and regulations to control export, transit, trans-shipment and re-export and controls on providing funds and services related to such export and trans-shipment such as financing, and transporting that would contribute to proliferation, as well as establishing end-user controls; and establishing and enforcing appropriate criminal or civil penalties for violations of such export control laws and regulations;'

Each State Party to the Biological Weapons Convention is therefore required to review its existing national measures, ascertain whether they are appropriate and effective in satisfying its obligations under the BWC and UNSCR 1540, and develop, adopt and enforce any additional measures required to fulfil these mandatory national implementation obligations.

The survey addresses 95 distinct criteria relating to:

- definitions of material subject to regulation;
- offences and penalties for prohibited activities involving biological weapons and biological agents and toxins, including preparations to commit offences and other forms of alternative criminal liability;
- jurisdiction of national courts over such offences;
- measures to prevent prohibited activities involving biological weapons and biological agents and toxins and the misuse of dangerous biological agents and toxins, such as:
 - the establishment and maintenance of control lists of dangerous biological agents and toxins, and related dual-use equipment and technology (with catch-all clauses);
 - accounting, security and physical protection of dangerous biological agents and toxins; and
 - transfer controls concerning dangerous biological agents and toxins; and
- law enforcement.

VERTIC staff research, collate and analyze a State's national implementing measures for these instruments – including legislation, regulations, decrees, administrative acts and other pertinent official documents – across a broad range of legislative measures, including penal laws, weapons- and treaty-specific laws, export control and strategic trade laws, public, animal and plant health and protection laws, biosecurity laws and customs laws. Our staff then enter the text of any provision which may serve to fulfil an implementation criterion in the appropriate cell, referencing the relevant source.

The State may have developed such measures specifically to fulfil BWC and/or related UNSCR 1540 obligations; these measures are usually more accurate and obvious, sometimes replicating the text of the

Box 2 VERTIC's biological weapons legislation surveys

BWC States Parties for which VERTIC has completed a legislation survey

Afghanistan, Albania, Algeria, Andorra, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bolivia, Bosnia-Herzegovina, Botswana, Brazil, Brunei Darussalam, Burkina Faso, Burundi, Cambodia, Cameroon, Chile, Colombia, Congo, Cook Islands, Costa Rica, Côte d'Ivoire, Croatia, Cyprus, Czech Republic, Democratic Republic of Congo, Dominica, Dominican Republic, Ecuador, El Salvador, Equatorial Guinea, Ethiopia, Former Yugoslav Republic of Macedonia, Gabon, Gambia, Georgia, Ghana, Grenada, Guatemala, Guinea, Guyana, Honduras, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Laos, Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Malaysia, Maldives, Mali, Marshall Islands, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Nepal, Netherlands, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Qatar, Romania, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Somalia, South Africa, Spain, Sri Lanka, Suriname, Swaziland, Switzerland, Tajikistan, Thailand, Timor-Leste, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United States, Uruguay, Uzbekistan, Vietnam, Yemen, Zambia and Zimbabwe (131 States Parties).

BWC Signatory States for which VERTIC has completed a legislation survey

Central African Republic, Egypt, Haiti, Somalia, Syria and Tanzania (six States).

States which have neither signed nor acceded to the BWC for which VERTIC has completed a legislation survey

Chad, Comoros, Djibouti, Eritrea, Israel, Kiribati, Namibia, Niue and Samoa (9 States).

international instruments. Alternatively or additionally, existing measures in general legislation may incidentally have the effect of partially implementing the Convention and the resolution. While such measures may have some relevance to BWC or UNSCR 1540 requirements, they likely lack the specificity necessary to be appropriate and effective. For example, legislation that establishes a licensing system for dangerous goods may not effectively address all the specific requirements necessary for a licensing system for biological agents and toxins.

In addition to completing a survey, VERTIC staff complete a survey overview, using a template we developed, which lists the laws we reviewed, additional laws we have identified as potentially relevant and which we request copies of from the State in order to complete the survey, and a summary of the survey with our recommendations for strengthening the State's legislative framework. Each completed survey and survey overview thereby gives rise to a gap analysis and a balanced, qualitative assessment which informs VERTIC's discussions with the surveyed State on the effectiveness of measures in force and on approaches for further strengthening its legal and regulatory framework. All such surveys remain confidential to the respective State. VERTIC also tracks those implementing criteria for which we have identified a pertinent measure, on a binary 0/1 datasheet that we developed (quantitative analysis) in order to conduct broader statistical analysis across States.

The list of implementation criteria in VERTIC's survey template is prescriptive and extensive, and reflects that each State Party is obliged, under Article IV of the Convention, "in accordance with its constitutional processes, [to] take any necessary measures", such as those in the template, to implement the Convention. The legislative approach taken in each State will necessarily reflect the scale of its implementation responsibilities, however it is feasible for even the smallest, least developed States Parties to give effect to this full range of criteria through concise legislative drafting approaches.

These surveys, along with our discussions with government officials from all over the world, reveal the status of national legislation and other implementing measures relevant to the BWC, certain trends in approaches to giving effect to the Convention through legislation, and particular issues which may impact (positively or negatively) on the further strengthening of States' BWC-related national legislative framework, all of which are discussed in the following sections.

2. Status of BWC national implementing measures in States Parties

To date, VERTIC has completed surveys for 131 of the 178 BWC States Parties (73 per cent). We have also completed surveys for all six signatory States and nine of the 12 States which have not signed or acceded to the Convention, to encourage and support their ratification or accession of the Convention, respectively, and to assist these States to fully implement the biological weapons-related obligations pursuant to UNSCR 1540. While our surveys were conducted during the period since 2008, we are broadly aware of subsequent legislative changes, not least as we use the surveys in our discussions with States about ways in which they might strengthen their regulatory framework. So the trends identified in these surveys are broadly reflective of the types and combinations of measures in force.

This section focuses on the regulatory framework in BWC States Parties only. It provides an assessment, based on VERTIC's quantitative data, of the status of national implementing measures for the criteria in VERTIC's survey template with regard to 73 per cent of States Parties. While this should not be construed as a compliance assessment, as the precise combination of legislative provisions needed to give effect to the Convention differs between States depending on their national situation (although not markedly, among developed States), and because it does not address the qualitative effectiveness of such measures, it does provide a useful insight into approaches to legislative implementation to date and discernable gaps in States' regulatory frameworks.

2.1 Definitions

We identified legislative provisions providing definitions for certain pertinent terms, including 'biological agent' (22 States), 'toxin' (13 States) and 'biological weapon' (16 States).

The definitions of 'biological agent' and 'toxin' were located in a range of laws, including specific BWC implementation acts (13 States) as well as other laws pertaining to public health (including those concerning infectious waste, biosafety technical standards and pesticides), strategic trade and counter-terrorism (eight States collectively).

The definitions of 'biological weapon', all were located in laws intended specifically to give effect to the BWC. Eight of these States' provisions developed a unique definition for 'biological weapon', which differs from, but is likely intended to be in line with, the General Purpose Criterion (GPC) definition contained in Article I of the Convention. Only six States' provisions transposed the precise formulation of the GPC, while two States' provisions instead made explicit reference to the Convention definition (the GPC). We are aware that at least two additional States not surveyed, but whose legislation we are familiar with, also effectively transpose the GPC definition. Both of these latter two approaches enable the legislation to be interpreted in accordance with States Parties' understanding of the scope of the General Purpose Criterion definition in the Convention, as reviewed at each successive Review Conference and recorded in the additional agreements relating to Article I in the Final Document of each conference. This legislative approach, therefore, is highly suitable for giving effect to the GPC.

2.2 Offences and penalties

We identified legislative provisions establishing offences and penalties for activities relating to biological weapons that are explicitly or implicitly prohibited under the Convention (and Operational Paragraph 2 of UNSCR 1540), or which are otherwise necessary to give effect to the GPC, such as for breaches of licensing requirements concerning activities involving dangerous biological agents and toxins.

Our analysis has identified offences and penalties for:

- developing biological weapons (37 States);
- manufacturing/producing biological weapons (55 States);
- acquiring biological weapons (46 States);
- stockpiling biological weapons (36 States);
- possessing or retaining biological weapons (46 States);
- transferring biological weapons (54 States);
- transporting biological weapons (33 States);
- using biological weapons (51 States);
- constructing, acquiring or retaining any facility intended for the production of biological weapons (2 States);
- engaging in activities involving dangerous biological agents or toxins without authorization, or in violation of the conditions of an authorization (35 States);
- transferring dangerous biological agents or toxins without authorization (51 States);
- transporting dangerous biological agents or toxins without authorization (23 States);
- penalties for providing false or misleading information to enforcement authorities (48 States); and
- penalties for offences committed by legal persons and their responsible officers, such as corporations (72 States).

We are aware that certain other States Parties for which we have not completed a legislation survey have also established a range of relevant offences and penalties.

Those offences concerning activities directly involving biological weapons (development, production, stockpiling, acquisition, retention, transfer, transport or use) were located in laws intended primarily to give effect to the BWC, such as amendments to the Penal Code (in civil law States) or the adoption of a BWC Act (in common law States). Some States included such measures in hybrid laws relating to the prohibition of both biological and chemical weapons. This approach was taken by States which had not previously given effect to the BWC upon adherence many years earlier, or which wished to update their existing BW-related provisions, or indeed which had only recently adhered to the BWC, and then adhered to the Chemical Weapons Convention and sought to fulfil both BWC and CWC legislative requirements through a harmonized approach. A group of States with a similar legal tradition have taken the approach of prohibiting these biological weapons activities in legislation relating to arms, ammunition and explosive weapons. Even fewer States employed a hybrid approach of establishing these biological weapons offences alongside those for chemical, (radiological) and nuclear weapons in 'weapons of mass destruction (WMD) Acts', or in legislation concerning terrorism prevention. Offences for breaches of transfer controls were located in laws concerning dual-use strategic goods and counter-terrorism.

More States that we surveyed have prohibited activities directly involving biological weapons, than other activities relating to breaches of preventative measures. Penal measures for breaches of authorization or licensing procedures relating to activities involving dangerous biological agents and toxins tend to be located in measures relating to human, animal and plant health, and food security.

2.3 Preparations to commit offences/alternative criminal liability

We identified legislative provisions that establish offences for preparing to commit a crime, for criminal acts committed by more than one natural person or legal person, such as companies and partnerships, or for acts which otherwise support the commission of an offence, as is required under Operational Paragraph 2 of UNSCR 1540; as well as for incomplete crimes (inchoate offences).

Our analysis has identified offences and penalties for:

- engaging in preparations to commit crimes (22 States), and for assisting (67 States), encouraging (41 States), inducing (45 States), ordering (29 States), or directing (25 States) anyone else to engage in those activities;
- attempting (95 States) or threatening (29 States) to commit those activities; and
- acting as an accomplice (72 States) or financing (78 States) them.

However, these offences for preparatory activities and alternative forms of criminal liability were primarily located in Penal Codes and, in common law States, in the general law establishing the criminal law framework (such as a 'Crimes Act'). This requires that offences and penalties for biological weapons-related activities must be established elsewhere in the State's domestic legislation. This is not the case for many of the States that we have surveyed, yet we collect the data as a useful starting point for discussions on how these gaps may be rectified.

It is interesting to note that many (but not all) States Parties which have a dedicated law to give effect to the BWC, or concerning the prohibition of CBRN or WMD (States use different formulations), have included offences for the activities such as the development, production or use of biological weapons – but not preparatory acts or other forms of alternative criminal liability – in such laws. For many of those States, we have not found criminal provisions for preparatory activities and other forms of criminal liability in other criminal legislation.

Some States have adopted legislation addressing terrorism, that establish offences for preparatory activities, attempts to commit terrorist offences, acting as an accomplice to or financing terrorist offences, and so on, however these can only be invoked in cases involving biological weapons activities where these are effectively covered by the respective law's definition of terrorist acts.

2.4 Jurisdiction over such offences

States Parties are obliged under Article IV to take any necessary measures to enforce the Convention within their territory, under their jurisdiction or under their control anywhere, in accordance with their constitutional processes, which necessitates legislation to establish various forms of jurisdiction to prosecute offences for activities which violate the Convention. We identified legislative provisions establishing jurisdiction over certain offences which are discussed in the two preceding sections.

Our analysis has identified jurisdiction over:

- offences committed in the State's territory or in any other place under its jurisdiction as recognized by international law (99 States);
- offences for which the alleged offender is a national of the State (89 States) or is a resident or stateless person whose habitual residence is in the territory of the State (35 States);
- offences committed with the intent to harm the State or its nationals or to compel the State to do or abstain from doing any act (that is, biological weapons crimes committed with terrorist intent, or biological weapons terrorism) (75 States);

- offences where the victim is a national of the State (54 States);
- offences involving the intentional use of biological weapons against any persons, irrespective of their nationality (9 States); and
- offences committed 'extraterritorially' (101 States).

As the data suggests in this, and other sections, not all States Parties have measures relating to each of these criteria. However, the manner in which States establish criminal jurisdiction is broadly similar: through a Penal Code (civil law States) or in the general law establishing the criminal law framework (common law States), such as a 'Crimes Act'; or through a counter-terrorism law. These counter-terrorism laws may also prohibit certain biological weapons-related activities, as well as establishing fairly comprehensive jurisdiction, covering crimes: where the offence is committed in the State's territory or anywhere under its jurisdiction; where the alleged offender is a national or resident of the State; where the offence was committed with the intent of harming the State's interests or nationals; where the victim is a national of the State; and in very few States, where the offence was committed by foreign nationals outside the State's territory, jurisdiction or control (universal jurisdiction). While the jurisdiction under these counter-terrorism laws is broad, the range of offences applicable to the BWC is not always so extensive. That is, such crimes only entail biological weapons-related activities (not other prohibited activity, such as unauthorized activities involving dangerous biological agents and toxins), and activities by non-State actors only (which may include 'legal persons' such as companies).

Similarly, criminal jurisdiction established under regular criminal law (Penal Codes, Crimes Acts etc.) is only as effective as the range of biological weapons-related crimes, such as those detailed in 'Offences and penalties' and 'Preparations to commit offences/alternative criminal liability' sections above. Our analysis indicates that there are significant gaps in such measures.

2.5 Preventative measures

We identified legislative provisions establishing measures to assist States to control dangerous biological agents, toxins and dual-use biological equipment and related technology in order to prevent and/or mitigate the possibility that they could be used in ways contrary to the Convention, as required by Article IV of the Convention and Operational Paragraph 3 of UNSCR 1540.

2.5.1 Preventative measures: control lists

Our analysis has identified control lists for dangerous biological agents and toxins (37 States) and for dual-use biological equipment and related technology (26 States), as well as legislative requirements for control lists to be reviewed, revised and updated (19 States). Such control lists are recommended under Operational Paragraph 6 of UNSCR 1540. Only 14 of the 131 States Parties surveyed had measures establishing control lists for both dangerous biological agents and toxins, and dual-use biological equipment and related technology, which also provided for these to be regularly reviewed and updated. Eleven States established both types of control list, but no review mechanism, while another seven States established a control list for dangerous biological agents and toxins only with no review mechanism.

We found such measures in various types of legal instruments, such as Acts, regulations under an Act, administrative orders or notices, and decisions by Cabinet, and many States had relevant provisions in a range of different measures. We identified control lists relevant to the BWC in legislation specifically concerning strategic goods and import/export and other forms of transfer control, as you would expect, but also in laws regulating human, animal and plant health, such as those concerning infectious disease

control, quarantine and occupational exposure to harmful substances. Some of these measures were specifically intended to give effect to strategic goods agreements to which the States are members. However, not all States surveyed that had such measures in place or which replicated, or drew on control lists promulgated by such groupings to develop their lists, participate in such mechanisms.

2.5.2 Preventative measures to account for, secure and physically protect dangerous biological agents and toxins

Our analysis has identified measures to account for the production (11 States), use (18 States), storage (11 States) and transport (18 States) of controlled items; as well as measures to secure the production (9 States), use (13 States), storage (16 States) and transport (31 States) of these items. We identified measures establishing penalties (either criminal or civil, or both) for failures to ensure proper security of these items (16 States), as well as measures to regulate their disposal (47 States). We found regulations establishing physical protection requirements for dangerous biological agents or toxins, and related penalties (8 States), for facilities involved in their production, use or storage (8 States) and facilities and vehicles involved in their transportation (6 States), as well as measures requiring the protection of related information (including electronic) (4 States).

We found measures establishing a national licensing authority (31 States) and concerning the authorization of activities involving dangerous biological agents and toxins, such as those requiring the licensing or registration of facilities and persons or notification of internal transfers (44 States); establishing conditions for exempting license conditions or revoking licenses (24 States); or requiring interagency review of licenses (3 States). We identified regulations concerning genetic engineering activities (51 States) and measures requiring authorization of transporters of dangerous biological agents and toxins (27 States) and background checks for personnel undertaking activities involving dangerous biological agents and toxins (5 States). In addition, we noted measures in force concerning the control of funding for activities involving dangerous biological agents and toxins (5 States).

Of the ten criteria that we look for in national measures relating to accounting and security of dangerous biological agents and toxins, we found only 18 States – of 131 States Parties surveyed – with at least four or more of these elements in their legislative framework, of which, five States had eight or more. Similarly, of the four criteria concerning physical protection and the protection of information related to dangerous biological agents and toxins, we found only eight States Parties with at least three of these elements incorporated into national measures. Of the six criteria relating to licensing, 26 States Parties had three or more elements in their legislative framework. Only four of the 40 States with licensing arrangements had provisions requiring background checks for personnel undertaking activities involving dangerous biological agents or toxins. Seven States had a range of implementing measures across accounting and security, physical protection and licensing. Nine States had a range of such measures across accounting and security, and physical protection (but not licensing), while seven States had such measures across accounting and security, and licensing (but not physical protection).

States most commonly addressed these criteria in a range of measures concerning:

- occupational health and safety;
- human, animal and plant health;
- medicines;
- phytosanitary procedures;
- hazardous materials and waste;
- genetic engineering and regulation of genetically-modified organisms;

- environmental protection;
- transport by road, rail and vessels; and
- dual-use strategic goods.

The measures included amendments to the Federal or Criminal Code, or other Acts, regulations, or ordinances and, for one State, such measures were combined in a new Biological and Toxin Weapons Act.

VERTIC's analysis of States' implementing legislation (surveys, survey overviews and data spreadsheet) indicates that a vast majority of States are yet to put in place any measures which help to prevent unauthorized access, theft or loss of dangerous biological agents and toxins, especially by terrorists, and to mitigate risks posed to people working with these materials.

2.5.3 Preventative measures to control transfers of dangerous biological agents and toxins

Our analysis has identified measures relevant to Article III of the Convention and Operational Paragraph 3(d) of UNSCR 1540, concerning the authorization of imports and exports of dangerous biological agents and toxins (81 States) and exemptions from such authorization (17 States). We identified measures concerning the establishment and operation of a national import/export control authority (54 States) and other relevant enforcement agencies or authorities (57 States). We located measures concerning end-user controls for dangerous biological agents and toxins (28 States) and catch-all clauses covering non-controlled biological agents and toxins suspected of being used illegally (that is, which have no justification for prophylactic, protective or other peaceful purpose) (25 States). We found measures regulating the import (60 States) and export (51 States) of dangerous biological agents and toxins; the transfer of intangible goods, such as manuals, software and publications (20 States); and the transit (36 States), trans-shipment (11 States) and re-export (21 States) of dangerous biological agents and toxins. Measures controlling brokering and other forms of assistance in the sale of dangerous biological agents and toxins or dual-use biological equipment and technology were also identified (21 States).

In this category, we identified 52 States with a licensing authority and authorization procedures for the import/export of dangerous biological agents and toxins (14 States had some other form of enforcement agency). Sixteen States have measures concerning end-use, catch-all and intangible transfer controls, while six additional States have measures relating to end-use and catch-all transfers only, and a further three States have measures for end-use and intangible transfer control (but not catch-all controls). Fifteen States have addressed transit, import/export and brokering of these materials in national measures, of which nine States also have measures concerning their trans-shipment or re-export.

We located provisions regulating import and export authorization in a range of measures concerning infectious disease control, quarantine, environmental protection, biological diversity and customs. Those States with the most comprehensive coverage of these issues – specifically, those which had addressed transit, re-export and brokering – had adopted a specific strategic goods law, or addressed prohibitions and strategic goods control through an omnibus WMD law, or a stand-alone law specifically concerning the BWC.

2.6 Enforcement (investigations, prosecutions etc.)

Our analysis identified measures to facilitate investigations (85 States), surveillance (68 States) and intelligence gathering (30 States) in cases of suspected misuse of dangerous biological agents and toxins, as well as measures enabling inspections in relation to dangerous biological agents and toxins (54 States).

We identified measures concerning entry, warrant and/or seizure procedures (110 States) and relating to the collection of evidence for law enforcement purposes, such as those relating to sampling techniques, analysis and chain of custody (81 States). We located measures enabling the prosecution of offences involving dangerous biological agents and toxins (83 States), and providing for law enforcement training to be able to investigate biological incidents (4 States). Measures facilitating co-operation and co-ordination with public health officials and other agencies (37 States) and legal co-operation and assistance with other law enforcement agencies (106 States) in the event of a biological incident involving dangerous biological agents and toxins were also identified. In addition, we located measures concerning the protection of confidential information (41 States).

We identified 13 States which have measures for regular inspections of activities relating to dangerous biological agents and toxins, such as to ascertain adherence to licensing conditions, but which had no additional provisions for investigating cases involving suspected misuse. On the flip-side, 44 States had measures enabling such investigations, but with no provision for regular inspections which could helpfully inform enforcement authorities of unlawful activity occurring. Forty States have provisions for inspections and investigations.

With regard to measures providing certain necessary law enforcement procedures, such as right of entry, warrants, seizure, evidence collection, sampling and chain-of-custody of evidence, we identified measures across all these issues for 66 States – primarily in general criminal law, not legislation specific to the BWC or CBRN. However, only four of these States have legislative provisions for law enforcement training in investigating biological incidents, such as the use of personal protective equipment, containment procedures and biological hazard assessment. Law enforcement of biological incidents could be hampered in States which lack legislative requirements for such training, unless these are otherwise provided for outside the scope of national measures. In addition, far more States have measures to facilitate cooperation with other law enforcement agencies in the event of an incident involving dangerous biological agents and toxins (105 States) than with public health officials and related agencies in such cases (35 States), which could hamper both law enforcement and public health responses to such incidents.

3. Implementation trends and issues

This section also focuses on the regulatory framework in BWC States Parties only. It offers some observations on the qualitative effectiveness of BWC national implementing measures, based on VERTIC's research, survey findings and ongoing engagement with States for over ten years, and provides some remarks on national implementation trends and issues which may impact on efforts to strengthen the collective corpus of States Parties' implementing measures.

The analysis above clearly shows that there are significant quantitative gaps in States Parties' implementing measures for the Convention; many States have yet to adopt necessary measures to give effect to certain obligations. There are many reasons for this, as participants and observers of the BWC and UNSCR 1540 processes are well aware. Many States are unable to make the issue a sufficiently high priority (especially if there is a perception that national implementation may not afford them tangible benefits) and have serious, valid resource constraints. They require sufficient funding, technical knowledge and expertise to establish an effective baseline legal framework, regularly update it, and routinely enforce it. Our experience working with States has shown that it usually takes many years to establish an effective baseline regulatory framework for the BWC and UNSCR 1540 (across nuclear, chemical and biological) – we have been working with some States for at least seven years to establish an effective baseline – due to the complexity of the task, the challenges in ensuring national inter-agency cooperation and the difficulty of prioritizing legislative drafting activities and securing a slot for parliamentary adoption of new legislation.

Of the measures in force, however, there are some discernable trends that give cause for concern on the effectiveness of certain approaches and which warrant further attention through technical discussions, legislative action and, if desired, legislative assistance activities.

Definitions: Not all States with a definition for 'biological weapon' in their legislation have transposed the GPC, creating a discrepancy with the BWC's GPC definition. States have also adopted a broad range of definitions – or none at all – for 'biological agents' and 'toxins'. We have found that States are more likely to have legislative definitions for 'biological agents', 'toxins' and 'biological weapon', as they relate to the Convention, if they have a specific BWC implementation act. States lacking definitions for 'biological agent', 'toxin' and certainly, 'biological weapon' will find it difficult to enforce the BWC prohibitions in their jurisdiction. In fact, given the rapid pace of scientific and technological developments which are relevant to the Convention, States Parties that do not apply the GPC definition, and thereby give effect to the additional agreements and understandings of the scope of the Convention, are not able to effectively fulfil their obligations under the Convention. The current five-yearly review of such developments, at Review Conferences, is also too long an interval at which to consider such developments. More regular reviews of scientific and technological developments which impact on the GPC are necessary to inform what should be a more regular review of the effectiveness of national legislative measures by States Parties.

Offences and penalties: Some States have mistakenly conflated the concepts of prohibiting biological weapons, and licensing authorized activities involving dangerous biological agents and toxins, by adopting legislation which prohibits the development, production and use (and other activities) of 'biological weapons' without a license. Instead, legislation should make a clear distinction between activities

directly concerning 'biological weapons', which must be subject to an absolute prohibition, and activities involving dangerous biological agents and toxins (such as those specified in control lists) and other biological agents and toxins (by means of a catch-all clause tied to the Article I definition) which are prohibited only if conducted without a license or in violation of license conditions. States could also usefully consider the effectiveness of their criminal and civil penalties for both types of offences (biological weapons-related crimes, and breaches of licensing and transfer control regimes) in terms of their punishment and deterrent effect, and ensure that penalties for offences of similar severity are consistent across their domestic legal framework.

It is clear from the focus and date of adoption of certain measures relevant to the Convention that they were, in fact, enacted primarily to give effect to international legal instruments relating to terrorism; there is a wave of measures adopted in the 2000s, for example. Aside from those more directly focused on implementing UNSCR 1540 (2004), many of these measures do not effectively cover biological weapons within the scope of terrorist or other criminal activity, nor do they cover the full range of prohibited biological weapons-related activities. Specifically, such legislation is not intended to – and does not effectively – regulate activities involving dangerous biological agents and toxins (such as through a licensing system), or prohibit such activities that are conducted without terrorist intent or purpose, or indeed, prohibit all banned biological weapons-related activities.

Jurisdiction: On the whole, jurisdiction over biological weapons-related crimes is fairly well established. As many States have adopted extraterritorial jurisdiction, or in a few instances, universal jurisdiction, over certain biological weapons crimes then these may be able to be prosecuted in alternative jurisdictions if a State with a primary nexus to the crime is unable or unwilling to take action, although this depends on the availability of credible evidence and some measure of legal cooperation among relevant States.

Preventative measures: While the adoption of control lists (and certainly requirements for them to be regularly reviewed and updated) is patchy, those lists adopted pursuant to an agreement by a group of States demonstrate good practice and harmonization, as evidenced by other States outside those agreements also choosing to use or draw on them as exemplars. The issue of harmonization and the adoption of comprehensive preventative measures are increasingly important with global trade and investment in related sectors, and more intense scrutiny by private industry suppliers of the strength of recipient States' regulatory frameworks. Aside from making BWC implementation more effective, harmonization of preventative measures (especially control lists and transport regulations concerning biological agents and toxins) is also a requirement of many regional agreements, such as those establishing customs or economic unions.

Our analysis of control lists has shown that those lists relating to animal and plant health have a more limited scope than those concerning human health and, for the purposes of BWC and UNSCR 1540 implementation, need to be complemented by measures controlling dangerous biological agents and toxins more broadly, as well as catch-all clauses.

Many States Parties also need to strengthen their legislative framework to ensure effective oversight of activities involving dangerous biological agents and toxins, including: creating independent oversight bodies, developing procedures and policies for authorizing certain research and related publications, tackling the challenges to the biological weapons prohibition posed by the increasing availability of dual-use agents, toxins, equipment and technology (including intangible technology) and inculcating a bio-safety and biosecurity culture in all relevant communities (such as through codes of conduct).

Our analysis of legislation in force also indicates that the passage of UNSCR 1540, with its collaborative assistance machinery, has not yet served to rectify all of the existing gaps in preventative measures for BWC States Parties after 12 years in force. However, given the rather limited implementation of suitable strategic trade controls in many States, assistance providers can work with these States to build an effective strategic trade control system and, depending on the available scope of the assistance provision, such

a system could be tailored to a State's required needs – such as addressing chemical weapons, and radiological and nuclear materials, and even conventional weapons if this is feasible and desired; certain States have indicated that this is their preferred approach.

Enforcement: More States could usefully establish or designate a national authority to more effectively coordinate national implementation and enforcement of the Convention (and related provisions in UNSCR 1540). There are various approaches to achieving this, which can be tailored to maximize the State's specific situation and any resource constraints. In fact, a national authority body that is tasked with determining resource requirements is well placed to make specific requests for assistance from other States and organisations (regional, international and even non-governmental) which are active in this assistance sector.

It is also perhaps surprising that many States have not adequately provided for cooperation among law enforcement and public health authorities (or animal and environmental health protection agencies) in the event of biological incidents through legislation, given so many of States' BWC-related implementing measures relate to public health (and animal and plant health) and the fact that agencies often require a legal mandate to facilitate such cooperation. Such measures are becoming increasingly vital, as the risks of biological attack continue to grow.

4. Conclusion

As noted by the Seventh BWC Review Conference, the enactment and implementation of necessary national measures under Article IV, in accordance with States' constitutional processes, would strengthen the effectiveness of the Convention. Further, national implementation of all relevant obligations provides greater confidence in compliance with international undertakings. However, the status of national implementation as assessed in this report shows that the adoption of exhaustive laws and regulations worldwide to implement the BWC and related provisions of UNSCR1540 has yet to be achieved.

A comprehensive framework including appropriate penal, biosecurity, export control and enforcement measures enables States to detect, respond to but also prevent prohibited acts involving biological weapons and dangerous biological agents and toxins. In addition, such a framework sends a signal to potential partners and investors that peaceful activities can be conducted in a secure manner; that may trigger foreign investment and the development of a national bioresearch sector.

The legal structure should nevertheless be in place regardless of existing or potential future co-operation programmes, as all States, even those with minimal activities involving biological agents and toxins, should adopt the required measures. Their content and level of detail, however, certainly depend to some extent on the scale of these national activities. States should also bear in mind that the preventative dimension requires BWC implementation to be undertaken proactively, before incidents happen, and not only reactively in response to incidents.

To increase confidence and transparency, legal measures adopted to give effect to the Convention should be reported under Confidence Building Measures (CBM) Form E, in which States Parties should declare whether they have legislation, regulations or other 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 their territory or anywhere under their jurisdiction or under their control anywhere;
- In relation to the export or import of micro-organisms pathogenic to humans, animals and plants or of toxins in accordance with the Convention; and
- In relation to biosafety and biosecurity.

This information is also to be referenced in a report submitted to the Committee established pursuant to UNSCR 1540 on steps taken to implement the resolution, as there are overlaps between the biological weapons-related provisions of the resolution and the BWC. However, States need to make sure that the specifics of each instrument are covered in their national legal framework, and that both the Convention and UNSCR 1540 are implemented fully. A holistic approach to national implementation, taking into account overlaps but also complementarities would help reach that goal.

Developing national legislation for the BWC and UNSCR 1540 is a technical and time-consuming task; but it is not insurmountable. All States have existing measures, such as criminal and enforcement provisions, to build upon, including signatories and non-States Parties. Legislative assistance programmes

exist to help review and draft legislation, such as VERTIC's National Implementation Measures Programme. Those programmes should aim to develop truly tailored approaches for each partner State, especially in the area of transfer controls and other preventative measures where harmonisation across CBRN, and possibly even extended to encompass conventional weapons, is a feasible solution.