
Confidence-Building Measures for the BTWC: Performance and Potential

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The common meaning of the term “confidence” is widely understood. Confidence has to do with belief or faith in something, such as one’s own ability or others’ willingness to act. Yet, confidence is tinged with uncertainty, because it involves the realm of the future and things not known. The study of probability and statistics has quantified the uncertainty and the degree of confidence in many different contexts, standardizing the notion of “confidence intervals” and “confidence levels.” Confidence has also entered the lexicon of international security and arms control. The concept has taken on new meanings in that arena while also retaining its ordinary meaning and that developed in mathematical applications.

This article examines confidence building in the context of a particular arms control agreement, the Biological and Toxin Weapons Convention (BTWC). The BTWC offers both a special scope and a difficult challenge for the application of confidence-building measures (CBMs). At the time the treaty was being negotiated in the late 1960s and early 1970s, effective

verification was thought to be impossible, and the treaty was therefore given quite modest provisions to address compliance issues. This void led states parties to become interested in supplementing the treaty with CBMs, but also increased the burdens that would be placed on such measures.

This article begins by briefly describing confidence-building measures and their development as a concept in international security. It next summarizes CBMs drafted and implemented among the parties to the BTWC in 1986 and 1991, and documents these measures’ subsequent disappointing performance. The limitations of these CBMs helped prompt treaty parties in 1994 to establish an Ad Hoc Group (AHG) to negotiate a protocol to strengthen the convention’s effectiveness. The AHG is currently negotiating a rolling text and has considered several CBMs as possible elements of the proposed protocol. This article describes the CBMs that have been proposed in these negotiations to strengthen the BTWC and evaluates their potential for building confidence.

We find that CBMs play an important but limited role in building confidence in nations' compliance with the prohibitions of the BTWC and in the treaty itself as an instrument to achieve biological and toxin weapons disarmament. Generally, their potential is limited to building confidence in the compliance of countries that are neither beyond reproach nor among the usual suspects of arms control violations, but are instead in between. Moreover, CBMs should not be entered into lightly; their implementation is neither free from cost nor certain to create the desired level of trust. CBMs cannot be a substitute for legally binding compliance measures and cannot be relied upon in isolation to sustain the BTWC.

PURPOSE OF CONFIDENCE-BUILDING MEASURES

Confidence-building measures are one of the instruments of arms control. Neither arms control nor CBMs have a universally accepted definition. At its narrowest interpretation, arms control consists only of negotiated and ratified treaties that limit the types or numbers of arms that a country can possess or use. A much broader understanding of the scope of arms control would include "disarmament, negotiated constraints, nonproliferation, export controls, confidence- and security-building measures, unilateral defense policies, aspects of diplomacy, international law, defense conversion, and certain activities related to international peacekeeping."² The purpose of arms control is threefold: "reducing the likelihood of war, its scope and violence if it occurs and the political and economic costs of being prepared for it."³ CBMs are an assortment of activities that states undertake primarily to become more sure that each understands the actions and/or intentions of the others.⁴

Arms control and CBMs have distinctions as well as areas of overlap. CBMs can appear in the form of or be a part of formal arms control agreements. They can also be implemented informally, and/or as a prelude to countries entering into formal arms control agreements. In this regard, their purpose is to create sufficient confidence between or among countries for them to enter into arms control obligations. In this article, we consider only those CBMs in the BTWC context that have been formally enacted by the treaty parties, or proposed as such in the rolling text of the protocol that is currently being negotiated to strengthen the effectiveness of the convention.

An individual CBM is usually centered around a specific military or security issue. During the Cold War, for example, the North Atlantic Treaty Organization and the Warsaw Treaty Organization employed CBMs to reduce the possibility that one side would misinterpret the other's actions as hostile and to reduce reliance on potential military actions. Such CBMs have typically taken the form of data exchanges, notifications of military training maneuvers or troop movements, and invitations to observe military or other activities. CBM proponents posit that these activities lead to openness and transparency, which reduces suspicion. This, in turn, lessens the likelihood that a misunderstanding or miscalculation would lead to accidental war.⁵

But the objective of CBMs can go beyond lowering the probability of war. CBMs can also be undertaken "to reinforce or bolster the primary obligations in a given treaty or to provide mechanisms for guarding against circumvention and for verification of compliance."⁶ In a less than completely transparent world, some uncertainty always exists regarding the intentions of other countries and their actual compliance with arms control treaties, even with those treaties that have relatively extensive and intrusive verification regimes. To the extent that surreptitious cheating on arms control obligations leads to a military or security advantage for the cheater, treaty parties have a strong interest in accurately ascertaining others' compliance with arms control accords. CBMs are one way to create the groundwork for increased confidence regarding treaty compliance. They do so if they provide an indication, not otherwise available, that is consistent with compliance behavior.⁷

CBMs can further the process of creating and sustaining confidence in an arms control setting in at least four inter-related ways. First, CBMs can contribute to the process by providing an additional tool to assess other nations' intentions and behavior. Countries are likely to consider a CBM desirable if the information contained therein was not known previously. Second, a CBM can reduce uncertainty in the observing nation's assessment regarding a state's actions or intentions. By reducing uncertainty, CBMs can increase confidence regarding the true state of a country's compliance with arms control obligations. This reduction in uncertainty can either result in increased confidence in compliance or in suspicions of noncompliance. Third, in a bilateral agreement, increased confidence in the other state's compliance will enhance confidence in the ability of the instrument (or

treaty) to accomplish its intended purpose. If the agreement is multilateral, increased confidence among many states is needed to enhance confidence in the treaty. Fourth, states may develop a generally positive, cooperative attitude toward each other, building mutual confidence that most closely resembles the ordinary meaning of the term. Such confidence might enlarge its positive influence beyond the specific starting point. However, any effect CBMs have on deterring or detecting noncompliance, while valuable, goes well beyond the primary purposes of the measures.

The distinction between *measures* that are intended to build confidence and the *process* of building confidence is important to keep in mind. The process of building confidence depends on many factors in addition to CBMs. Thus, CBMs may or may not achieve their desired ends. While CBMs can enable increased confidence, that outcome is by no means automatic. Increased confidence materializes only if the information revealed by the CBMs is sufficiently reliable, matches other patterns of behavior and information sources, and therefore warrants movement along the confidence scale.

THE POTENTIAL UTILITY OF CBMS

The primary obligations undertaken by parties to the BTWC, which entered into force in 1975, are contained in Article I and are worth reiterating. States agree not to develop, produce, stockpile, acquire, or retain biological agents or toxins of types and in quantities that have no justification for prophylactic, protective, or other peaceful purposes. The same prohibitions apply to weapons, equipment, or means of delivery designed to use such agents or toxins for hostile purposes. Subsequent articles require the destruction of any biological weapons and prohibit the transfer of prohibited weapons and means of delivery. These prohibitions offer several discrete, substantive areas for the application of CBMs.

CBMs could concentrate on the types of agents or toxins possessed and/or the quantities possessed. Every state participating in the BTWC has the implied obligation to provide a peaceful-purpose justification for all types and quantities of agents or toxins that it possesses. CBMs could provide an opportunity to reveal these justifications to the international community. In addition, CBMs could focus on weapons, equipment, or means of delivery, examining whether such machinery is justified for purposes not prohibited by the BTWC. *Ideally*, CBMs would help countries do two things: (1) to know

with greater certainty that what a country says it is doing with biological agents or toxins and machinery at a known facility is in fact what it is doing; and (2) to know with greater certainty that neither declared or undeclared facilities are being used for biological and toxin weapons purposes. These two goals relate to the accuracy and the completeness, respectively, of the information provided by a state. Increasing confidence in the former is easier to accomplish than increasing confidence in the latter.

All CBMs vary according to the strictness of the obligation, if any, to comply with them. CBMs can be voluntary, legally binding, or “politically binding.”

- **Voluntary CBMs** are actions taken unilaterally or by groups of states to build confidence. Although countries are not required to participate in voluntary CBMs, they can be specified in a formal document. For example, the final declaration of a BTWC review conference could urge or create incentives for states to host or participate in visits to biological facilities in other countries on a voluntary basis.

- **Legally binding CBMs** embodied in an agreement that governments sign and ratify have the force of international law. Any CBMs contained in the protocol under negotiation to strengthen the effectiveness of the BTWC will be legally binding for those states that ratify the protocol, unless they are clearly designated as voluntary measures.

- **Politically binding CBMs** fall somewhere in between voluntary and legally binding activities. The data exchanges and other measures agreed to at BTWC review conferences in 1986 and 1991 are often referred to as politically binding CBMs. As such, they are measures that nations formally agreed to abide by, though their commitments do not have the full force of international law. The formal agreement adds political muscle and a certain degree of moral suasion to push countries to fulfill their commitments and thus distinguishes them from voluntary CBMs.

Many countries are more likely to participate in and meet the obligations of legally binding CBMs than with the other two types. Thus, information from countries of interest will more likely be obtained by making CBMs legally binding. Nevertheless, while CBMs can be made legally binding, one cannot legally bind countries to develop confidence in other states' compliance with treaties; the intended result of CBMs—building confidence—cannot be forced on others.

One thorny aspect of creating and sustaining confidence in compliance with multilateral treaties is that the national judgment of whether or not a country is in compliance is integrally linked to an individual country's identity. For better or for worse, each participating state has generated a behavioral reputation via its actions and rhetoric. This track record gives rise to assumptions and judgments in other nations, as well as to differing standards of evidence. If a country is democratic, scrupulously compliant with other treaty obligations, not an aggressor in recent international conflicts, and unfailingly cooperative with respect to inquiries, a relatively low standard of evidence is sufficient to convince most countries of this state's compliance. Conversely, a closed country with a totalitarian or autocratic form of government that has been lax in its compliance with other agreements, has an aggressive reputation, and hinders or delays responses to treaty-related inquiries will be held to a more stringent standard of proof. Moreover, the relationship between individual countries inevitably influences judgments about compliance. Hypothetically, if Egypt and Pakistan were both assessing India's adherence to the BTWC, considerably more evidence would probably be required to convince Pakistan than Egypt that India was acting in compliance. While this problem exists with other multilateral arms control agree-

ments, it plays a larger role in assessing compliance with the BTWC because such compliance is more difficult to judge on independent factors. The development and production of biological and toxin weapons are, unfortunately, relatively easy to conceal.

When a nation submits data under CBMs or legally mandated declarations, the extent to which this data increases confidence is dependent on the prior estimation of a country's compliance and the quality of the information submitted. Table 1 illustrates our assessment of the effect of these two factors on the confidence level regarding any particular country. The matrix columns represent countries, divided into three categories, according to the degree of suspicion of non-compliance prior to the receipt of data. The two rows in the matrix distinguish between the case where a state supplies trustworthy and complete information that is consistent with compliance and that where data is absent altogether, or incomplete, inadequate, or inconsistent with information from other sources.

For the six sets of circumstances depicted in the table, we estimate the likely effect on confidence in each case as follows:

- Box 1. A country suspected of non-compliance submits information consistent with compliance. Reac-

Table 1: The Effect of Information Quality and Prior Suspicion on Confidence

Quality of Information Submitted by a Country	Prior Degree of Suspicion		
	Very Suspicious of Country	Uncertain, Slightly Suspicious of Country	Not Suspicious of Country
Complete, Consistent	1. No change in estimate of compliance.	3. Change estimate of compliance. More confident of compliance.	5. No change in estimate of compliance.
Inadequate, Incomplete, Inconsistent, Absent	2. More confident of estimate of non-compliance.	4. Change estimate of compliance. More confident of estimate of non-compliance.	6. Less confident of instrument. Undermines the regime.

tion: So what? This country's prior poor behavior overrides what is seen as non-convincing information, especially given the fact that biological and toxin weapons are relatively easy for a country to manufacture and hide. This country continues to be regarded as non-compliant. Only fundamental changes in a country's behavior, over a range of activities and for a long period of time, or perhaps a change in political regime might eventually decrease the existing mistrust.

- Box 2. A country suspected of non-compliance submits information inconsistent with compliance. Reaction: States are more convinced than ever that this country is not in compliance and has something to hide.
- Box 3. A country that is slightly suspected submits information consistent with compliance. Reaction: Suspicions about this state decrease and the estimated likelihood that this country is complying increases.
- Box 4. A country that is slightly suspected submits information inconsistent with compliance. Reaction: In general, states become more suspicious and estimates of that country's compliance decrease.
- Box 5. A country that is not suspected submits information consistent with compliance. Reaction: The information provided is expected and therefore does not change the prevailing estimates of compliance.
- Box 6. A country that is not suspected submits information inconsistent with compliance. Reaction: What is the matter? Why did this country not take its commitment to submit data seriously? When countries under no suspicion of violation do not fulfill their obligations, confidence in the regime, *but not necessarily the country*, is undermined.

This analysis suggests that CBMs, particularly those that are not legally binding, are successful only with a limited group of countries. A typical success story would be a country that other governments are somewhat concerned about, and are seeking more information about, in order to either ameliorate or support their concerns. When a country falls into this undecided category, other states are willing to accept data that increases their confidence of compliance.⁸ For these countries, confidence in compliance can be increased, especially over time, if the CBM data submitted are consistently complete, address areas of previous concern, and are presented in an open and straightforward manner. Eventually, confidence may increase to the point where countries move

from the middle column of the matrix to that on the right. Similarly, to the extent that a country submits information that is inconsistent with compliance and does not cooperate with attempts to resolve data discrepancies, e.g., through confidence-building visits, other states will be more confident in their suspicions. Eventually, confidence may decrease to the point where countries move from the middle column of the matrix to that on the left.

Box 6 reveals an interesting and somewhat counter-intuitive situation. Establishing CBMs is not an endeavor without costs. If CBMs are so time-consuming and onerous that compliant countries begin to let their obligations slide, their negligence could undercut rather than bolster confidence in the treaty involved. In particular, a CBM that requires states to collect and submit information that is readily available elsewhere could overburden states that are otherwise sincerely trying to meet their CBM or treaty obligations. For example, one could seek to require states parties to submit data on relevant publications in the field of biosciences. While the information regarding relevant publications would be of value to an organization charged with monitoring the BTWC, requiring states parties to provide information which is publicly available, in contrast to creating the capacity within the organization to collect this information from open sources, could unduly burden the states. Preferably, only those measures that are likely to contribute meaningfully to building confidence should be included in a CBM agreement. Also, they should be tailored as precisely as possible to avoid creating new obligations on states simply for the sake of doing something.

The matrix analysis also indicates that the international community should not attempt to place the whole confidence-building burden on measures that will likely have an effect on only a relatively small proportion of countries. Serious compliance concerns require adopting measures more stringent than politically binding declarations. Yet there is a link between the performance of CBMs and such other measures. Incomplete, inconsistent CBM information can act as an early warning that treaty compliance is suspect. Thus, if other mechanisms such as non-compliance investigations are available, states may use CBM performance to focus their attention on certain states. Although even intrusive investigations of non-compliance concerns may not find conclusive evidence of a treaty violation, the ease with which host officials admit investigators or visitors to fa-

cilities, the completeness of a facility's records, and other factors all contribute to a picture of compliance or non-compliance. The UN Special Commission (UNSCOM) experience in Iraq showed that while inspectors did not find clear evidence of biological and toxin weapons production for a long time, the observations of the inspectors and the behavior of the Iraqis were consistent only with the existence of a covert biological and toxin weapons program. UNSCOM became more confident, over time, of their suspicions that the Iraqis were hiding information about their biological and toxin weapons program and with persistence found evidence to confirm those suspicions.⁹

On the other hand, sustaining strong suspicions of a country's non-compliance could become increasingly difficult in the face of information from on-site measures that supports compliance.¹⁰ Combined with compliant behavior in regard to data submission, this might result in moving a country from the left column of the matrix to the middle column.

Even if they are not consequential in every case, CBMs are nevertheless valuable, primarily because of their effects on countries that fall into the middle category. CBMs can increase confidence in some countries' compliance even if they cannot increase confidence in all countries' compliance. Moreover, CBMs can maintain incentives to keep countries from undertaking activities that could place them under suspicion. In other words, CBMs help keep countries from moving from the right column of the matrix to the middle column or from the middle column to the left column. Similarly, CBMs may resolve minor discrepancies or questionable activities, having the effect of moving countries from the middle column of the matrix to the right. By providing a way for countries that are falsely an object of suspicion or uncertainty to reassure the international community about their compliance record, CBMs can help the international community focus its limited resources on the countries that really should be objects of concern.

CONFIDENCE-BUILDING MEASURES ESTABLISHED UNDER THE BTWC

Having described in general the potential value of CBMs and the circumstances under which they are likely to be helpful, we now turn to the establishment and development of the CBMs that are in force under the BTWC. After briefly reviewing the history of CBM development in relation to the convention, we look at

some of the data declared and analyze what effect the CBMs have had on the BTW control regime.

History

Members of the BTWC, which now number 143 states, have long recognized the problems created by the treaty's absence of mechanisms to provide reassurance of compliance or to respond effectively to accusations of non-compliance. These weaknesses came sharply into focus in the 1980s, when the United States accused the Soviet Union of violating the treaty. Its accusations centered on two separate phenomena. First, the US government suspected that an outbreak of anthrax in the Soviet city of Sverdlovsk (now Ekaterinberg) was caused by illicit activities.¹¹ Second, the United States claimed that the so-called "Yellow Rain" in Southeast Asia was a deliberately disseminated toxin supplied by the Soviet Union.¹²

The events following these public accusations vividly demonstrated the weaknesses of the BTWC. The convention designates the UN Security Council as the forum to resolve issues of treaty non-compliance. As a result, if one of the five permanent members of the Security Council were to be the subject of an accusation, its veto power in the Council could block any possible resolution of the issue. Because of this, the United States did not use the consultation procedures outlined in BTWC Article V or take its case to the Security Council. Instead, the United States raised its suspicions of Soviet non-compliance publicly.¹³

Moreover, suspicions of biological weapons proliferation grew. As early as 1988, in the United States, a Defense Department witness testifying before Congress stated that between 1972 and 1988 the number of countries "having or suspected of having" offensive BW programs rose from four to ten.¹⁴ In 1990, Admiral C.A.H. Trost of the US Navy testified that the number of countries suspected of developing biological weapons had risen to 15.¹⁵ It is telling that these early references to BW proliferation came even before details were revealed about the Soviet Union's or Iraq's extensive BW programs.

Recognizing the inherent political obstacles to resolving the most pressing compliance questions in the Security Council and the absence of verification measures, states parties sought other methods to discern whether biological activities were undertaken for peaceful pur-

poses, as required in the convention. Thus, during the Second Review Conference, in 1986, the participants considered mechanisms to strengthen the BTWC. Some countries supported the development of verification mechanisms, while others were skeptical whether such an approach was workable. Ultimately, states parties agreed to initiate measures to decrease secrecy regarding relevant biological facilities and activities. “[I]n order to prevent or reduce the occurrence of ambiguities, doubts and suspicions,”¹⁶ they agreed to exchange information annually on areas of relevance to the convention, to encourage publication of results of relevant biological research, and to actively promote contacts between scientists. These activities resembled to a large degree the confidence-building activities that were being implemented under the Conference for Security and Cooperation in Europe (CSCE). Modalities for these activities under the BTWC were developed during an Ad Hoc Meeting of Experts early in 1987.¹⁷ Interestingly, neither during the review conference in 1986 nor during the expert meeting in 1987 does the term CBM appear; this term is only used starting with the Third Review Conference.

Beginning in 1987, all BTWC member states were to submit relevant data to the United Nations, which functions as the repository for it. The Third Review Conference, held in 1991, clarified and added details to the information exchange established in 1986.¹⁸ Four areas

of information exchange were added to those already adopted. To make submission of these CBMs simple, a form was prepared for countries to complete, including a “nothing to declare” and a “nothing new to declare” option. Table 2 summarizes the areas of information exchange that states agreed to in 1986 and 1991 (CBMs agreed to in 1986 are marked with an asterisk).

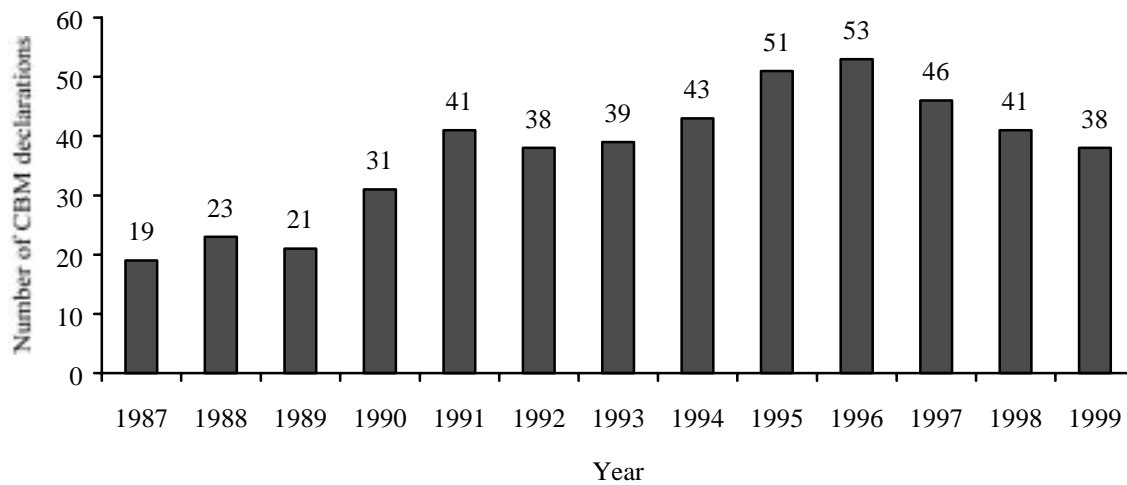
These information exchanges later came to be referred to as CBMs. The negotiating record suggests they had two goals: to reduce the uncertainty surrounding the extent and purposes of permitted biological activities, and to build confidence in the arms control process, leading to the development and implementation of more stringent measures later.

Participation in the BTWC CBMs

The international response to these agreed politically binding CBMs has been disappointing. The majority of BTWC members have not devoted sufficient resources to recurring and timely completion of the CBM forms.¹⁹ There has not been a single year between 1987, the first year of the data exchange, and 1999 in which a majority of the states parties have taken part in the data exchange. Figure 1 shows the number of states that participated each year between 1987 and 1999. Only 10 countries have made declarations every year since 1987. Three additional states, however, have submitted data

Table 2: Content of CBM Declaration Forms

Form	Content
0	Statement on “Nothing to declare” or “Nothing new to declare”
A1*	Exchange of data on research centers and laboratories
A2	Exchange of information on national biological defense research and development programs
B*	Exchange of information on outbreaks of infectious diseases and similar occurrences caused by toxins
C*	Encouragement of publication of results and promotion of use of knowledge
D*	Active promotion of contacts
E	Exchange of information on relevant legislation, regulations, and other measures
F	Exchange of information on past activities in offensive and/or defensive biological research and development programs
G	Exchange of information on vaccine production facilities

Figure 1: CBM Declarations Submitted by Year

every year starting one year after the BTWC entered into force for them.²⁰

Several factors may account for these lackluster results. One straightforward explanation may be that countries are ignoring their obligations because they are hiding biological and toxin weapons programs. Yet even the most pessimistic estimates of the number of states parties that may be hiding BTW programs does not come close to the scores of treaty parties that have never participated, or do not do so regularly. Clearly other explanations are in order.

A second possible explanation is that few, if any, consequences emanate from states' failure to participate. Some countries may suffer mild international criticism for their failure to provide the required information, but no penalties or other sanctions are imposed. A third explanation is that completion of the declaration forms was more complicated than anticipated, requiring collection of data that not all states had previously collected. Brazil has argued, for example, that the paltry response to the information exchange is evidence of the difficulties of keeping track of relevant industries. Consequently, delays in submitted declarations and information gaps in the data would not necessarily indicate deliberate disregard of a country's obligations. Rather, such lapses might reflect an inability to perform the required duties.²¹ Inability to obtain information may play a role in explaining why even a few large countries—Indonesia, Ni-

geria, and Pakistan—have never participated in the information exchange.

Another possible reason for uneven participation in information exchanges could be that there is limited interest in the issue of BTW control; participation in the control regime is not high enough on the political agenda of a large number of states. It is particularly disheartening that the annual participation has fallen every year since its peak in 1996. Finally, states parties may feel that without legally binding declarations, follow-up measures for the information contained therein, and the ability to investigate allegations of non-compliance on site, compiling the necessary information for the CBMs is not worth the effort involved. Whatever the reasons, the evidence seems irrefutable that a large number of BTWC members have not taken these politically binding CBM commitments seriously. Disinterest and apathy may be part of the story. Many states appear not to be sufficiently interested in the BTWC to honor their commitments or to devote sufficient resources to their foreign ministries to catalyze the process.

Increasingly, however, benign explanations for negligence or half-hearted participation may invite skepticism. Those countries that have fully complied demonstrate that participation is indeed feasible. The growing interest in strengthening BTW control has also focused attention on the relevant mechanisms already in place, i.e., the existing CBMs. Finally, the increasing

number of states that have participated at least once puts growing pressure on states that have so far stayed outside the annual exercise. Through 1999, more than half of the 143 treaty parties, namely 80, have made at least one such declaration. In addition, one signatory and one other state made one-time CBM declarations under the BTWC, bringing the overall number of states that have made at least one CBM declaration to 82. Moreover, 43 of the 82 countries participating in the exchange have made declarations five years or more.

It is striking that most of the countries that participated on a regular basis were experienced in the CBM exercise through the CSCE. It may be that the CBM approach was simply taken out of a regional, East-West context in the CSCE, where it was working reasonably well, and put into an international context, where it does not work as well. Only slowly did non-CSCE states participate in the information exchange. Even countries such as Iran and India that have played an active role in BTWC review conferences and other activities have joined the CBM exchange only quite recently, i.e., 1998 and 1997, respectively.

Content of the Information Exchanged

While it is relatively simple to keep track of whether or not countries have submitted data, describing the contents of the data, and how they have changed over time, is more difficult. BTWC members have not devoted sufficient resources to manage the administrative work under the treaty. Consequently, the CBM documents are not officially translated and made available through the UN documents center. Comprehensive analyses of the data, which would presumably play the biggest role in building confidence, are difficult, time-consuming, and expensive. Some governments may be doing appropriate analyses and using them internally. Nonetheless, to enable these CBMs to fulfill their purpose, it would seem imperative that BTWC members commit the resources necessary to conduct such analyses and appropriate follow-up. The upshot of this situation is that the task of publicly reviewing this data has fallen to non-governmental researchers. The following sections present our analysis of the data submitted through 1998.²²

Despite the disappointing level of participation, the information contained in the declarations nonetheless tells something about the general biotechnological, as well as the biological and toxin weapons capabilities, of the participating countries. Particularly insightful in this

regard are the data concerning past offensive and defensive biological activities, current biodefense programs, and relevant facilities such as maximum containment and vaccine production facilities.

The data derived from the CBM information exchange have to be used with caution. First, the quality of the data provided is extremely varied. Second, sometimes the information provided must be regarded with skepticism. Iraq, for example, stated in 1993 that it had no past offensive biological program—a statement that has been shown by UNSCOM to be false. Third, as noted above, not all states parties to the BTWC have taken part in the information exchange. And finally, the fact that some countries provide data only rarely makes it very difficult to assess whether these are still accurate three or more years later.

Past Activities in Offensive and/or Defensive Biological Research and Development Programs

Seventeen states provided information between 1992 and 1998 in regard to past activities in offensive and/or defensive biological research and development programs. Five of these states provided data on past offen-

Table 3: Past Offensive and Defensive Biological Research and Development Programs

State	Declared period of offensive activities	Declared period of defensive activities
Australia	-	1994 – present
Belgium	-	1966 – 1970
Canada	1946 – 1956	1946 – present
China	-	1958 – present
Czech Republic	-	1961 – 1980
France	1946 – 1973	1946 – present
Germany	-	1958 – present (1955 – 1990 in former German Democratic Republic)
India	-	1973 – 1994
Iraq ²³	-	1986 – 1990
Italy	-	1991 – 1992
Netherlands	-	ca. 1950 – present
Poland	-	since ca. 1975
Russian Federation	1946 – 1992	1946 – present
South Africa	-	1987 – 1992
Sweden	-	1960 – present
United Kingdom	1940 – 1957	1940 – present
United States	1941 – 1969	1941 – present

Table 4: National Biological Defense Research and Development Programs as of 1998

State (with year of last CBM submission)	Declared annual level of financing for the program	Declared number of facilities involved in the program	Declared number of personnel involved in the program (excluding contract staff)
Australia (1998)	600,000 Australian dollars	1	7.7 staff years, 12 personnel
Belarus (1997)	3638.1 million rubles	1	No data provided.
Canada (1998)	about 2.4 million dollars excluding salaries ²⁴	1	26
China (1998)	2.95 million yuan renminbi	1	207
Finland (1998)	320,000 finmarks	2	13-15
France (1998)	14 million French francs	1	20
Germany (1998)	7.3 million Deutsche marks	2	55
India (1997)	2 million rupees	1	25
Italy (1998)	No data provided.	1	6
Netherlands (1998)	about 500,000 US dollars	1	7
Norway (1998)	300,000 US dollars	1	12
Poland (1998)	No data provided.	1	10
Russian Federation (1998)	63,836 million rubles (taking inflation into account, in 1997 prices)	6	3,325
Spain (1998)	45 million pesetas	1	7
Sweden (1998)	about 14 million Swedish kronas	1	24
Switzerland (1998)	300,000 Swiss francs	0	No data provided.
United Kingdom (1998)	about 14 million British pounds	1	606
United States (1998)	about 88.3 million US dollars	18	1,063 ²⁵

sive programs. States and declared periods of activity are summarized in Table 3.

National Biological Defense Research and Development Programs

Twenty-two states provided information between 1992 and 1998 on national biological defense research and development programs. Eighteen of these states declared such a program to still be active in 1998. Table 4

summarizes the data provided by these 18 states. The additional four states, that once declared information under this CBM but no longer have relevant defense programs, are the Czech Republic, Mongolia, the Slovak Republic, and Ukraine.

Research Centers and Laboratories

Between 1987 and 1998, 39 states provided information on relevant research centers and laboratories. They

declared almost 250 facilities, not all of them of primary importance under the BTWC. During the Third Review Conference, states parties had agreed to exchange information on facilities “that meet very high national or international safety standards...or specialize in permitted biological activities directly related to the Convention.”²⁶ Facilities at the highest designated level of containment, Biosafety Level 4 (BL4), are of particular interest. Between 1987 and 1998, states declared an overall number of 68 BL4 facilities. Forty-two of these were declared to be active in 1998. Of these 42 active BL4 facilities, 32 were located in Western group states, six in Eastern European group states, and four in Non-Aligned group and other states.

States also declared facilities that were partly or fully financed by ministries of defense. In addition to those which had been declared under CBM form A2 on na-

tional biological defense programs, states declared 12 facilities that were partly or fully financed by ministries of defense in 1998. Five of these 12 facilities are located in Western group states, four in Eastern European group states, and three in Non-Aligned group and other states. One of these 12 facilities also had BL4 containment.

Vaccine Production Facilities

Between 1992 and 1998, 37 states provided information on vaccine production facilities. It is important to note that although the CBM form asks only for production of vaccines licensed for the protection of humans, several countries also declared production facilities for animal vaccines. Nineteen Western group states have declared almost 130 facilities since 1992, about 80 of which were declared to be in use in 1998. Eight Eastern European group states have declared about 40 facilities since

Table 5: Facilities Producing Vaccines for the Protection of Humans Against Diseases of High Relevance to the BTWC by Country as of 1998

Country	Declared number of facilities producing vaccines for the protection of humans against:			
	Anthrax	Plague	Smallpox	Botulism
Australia		1		
Canada				1
China	1	1		
Japan				1
Poland				1
Romania			1	
Russia	1	2	1	
United Kingdom	1			1
United States	1	1		
Total	4	5	2	4

1992, about 30 of which were declared to be in use in 1998. And 10 Non-Aligned group and other states declared about 60 facilities since 1992, about 50 of which were declared to be in use in 1998. Table 5 shows the distribution of facilities producing vaccines for the protection of humans against diseases considered to be of high relevance to the BTWC.

As the table shows, surprisingly few facilities produce vaccines against diseases considered to be highly relevant to the BTWC. In contrast, states declared in 1998 almost 70 facilities producing vaccines against tetanus, almost 30 facilities producing vaccines against cholera, and about 20 facilities producing vaccines against poliomyelitis.

Effects of These CBMs

A state-by-state analysis of changes in countries' confidence in other countries' compliance during the period of the data exchange is beyond the scope of this article. Moreover, most countries do not make their official assessments of other countries' compliance public. The United States, which does report annually on other countries' treaty compliance in a report to Congress, lists only those countries that it suspects are not in compliance and provides few clues regarding the information that led to the assessments.²⁷ Nevertheless, despite the amount of data provided, the information-exchange CBMs seem to have done little to build confidence in states' compliance or the BTWC's efficacy. Indeed, spotty compliance *with the CBMs* can be considered a relevant factor propelling the international community to negotiate and implement a BTWC protocol with legally binding declarations and other provisions that are much more demanding than the existing CBMs.

The Fourth Review Conference, held November 25 to December 6, 1996, considered the performance of the CBMs established at the earlier review conferences. Noting the continued importance of the CBMs, the conference urged states to submit full and timely reports, while recognizing that some parties experienced technical difficulties in doing so. Mindful of the possibility of interfering with or undermining the ongoing work of the Ad Hoc Group at a critical juncture, the conference refrained from any action concerning the CBMs. With a flourish of diplomatic rhetoric, however, the Final Declaration affirmed that participation in the information exchanges established at the earlier review conferences

"has contributed to enhancing transparency and building confidence."²⁸

Clearly, however, the efforts to institutionalize and augment CBMs have not to date lived up to expectations. Nearly all observers recognize that these CBMs have attempted to carry a Herculean burden—that of building confidence in compliance in the absence of legally binding verification measures. Compared to a strong compliance protocol, these CBMs are a feeble bag of tools. The CBMs are a useful beginning, but not sufficient to complete the task. Nevertheless, one positive consequence of the CBMs is to give states parties that are interested in strengthening the BTW control regime a forum to express this interest. Many of the strong supporters of enhanced verification measures have taken part regularly in the data exchange, especially in recent years.

International events also played a role in convincing states parties that stronger measures than ill-implemented CBMs needed to be instituted for the BTWC and, in the wake of the Cold War, were politically possible. Particularly chilling were the revelations regarding the Soviet biological and toxin weapons program that operated for nearly two decades in violation of the BTWC²⁹ and UNSCOM's discoveries of the Iraqi BTW program.³⁰ Beyond the dramatic revelations concerning the BTW programs in the Soviet Union and Iraq, concerns about BTW proliferation and covert offensive programs in other states also persisted. Thus, BTWC members have put considerable resources into concluding a legally binding protocol to strengthen the treaty regime. The diplomatic focus is almost entirely on the future instrument; there is virtually no thinking about the existing CBMs, nor any analysis of how they could be changed to provide better information or lead to increased confidence.

CONFIDENCE-BUILDING MEASURES UNDER CONSIDERATION BY THE AD HOC GROUP

The Ad Hoc Group's mandate directs the delegations to consider four separate areas in the context of drafting proposals to strengthen the BTWC: (1) definitions of terms and objective criteria; (2) confidence-building and transparency measures; (3) measures to promote compliance; and (4) measures to implement Article X of the convention (which calls for science and technology exchanges and non-hindrance of economic development).³¹ The AHG, which has been negotiating since 1995 and

is working from a rolling text that was first introduced in July 1997, is thus obliged to consider CBMs for inclusion in the future BTWC protocol. However, the Friend of the Chair on CBMs was active only from the second to the fifth session, i.e., until September 1996, and as of September 2000, the AHG has devoted little effort to discussing the role CBMs could play in a protocol to augment and reinforce the other components.

Many of the existing politically binding CBMs will be incorporated into the legally binding declarations in the future BTWC protocol. For example, the negotiators are considering declarations of (1) current defense programs and facilities; (2) past biological programs, both offensive and defensive; (3) maximum containment facilities; and (4) vaccine production facilities.³² The tabling of these measures indicates a view prevalent within the AHG that mandatory declarations, backed up by some type of on-site measures, are the essential components of a protocol. Two types of on-site measures are under consideration. The first type, known in the BTWC protocol negotiations as “investigations to address a non-compliance concern,” would have the power to investigate the alleged use of BTW and non-compliance concerns at pertinent facilities. The second type would not be associated with a non-compliance concern and is often referred to as “non-challenge visits.”³³ While these non-challenge visits share some characteristics with routine inspections under the Chemical Weapons Convention, important differences preclude the use of that more familiar term in the BTWC context.

The AHG evaluated a number of CBMs for their contributions to strengthening the BTWC, namely (1) surveillance of publications; (2) surveillance of legislation; (3) data on transfers and transfer requests and on production; (4) multilateral information sharing; (5) exchange visits; and (6) confidence-building visits.³⁴ Most of these are also included in the current rolling text.³⁵ Each of these CBMs is discussed in greater detail below. In a somewhat perverse turn of events, the AHG is discussing these measures as voluntary measures only. In other words, the delegations are not contemplating these CBMs as legally binding, as other components of the protocol would be, nor as having the politically binding status of the 1986 and 1991 CBMs. On the other hand, most of the CBMs are also being considered as binding measures in other fora of the AHG. Surveillance of transfers and transfer requests as well as different types of visits, for example, are also discussed under

Article III of the future protocol, which sets down compliance measures. Since the sixth AHG session, no meetings have taken place to discuss CBMs. As the final shape of the protocol becomes clearer, the Ad Hoc Group is bound to give renewed attention to the CBMs that are currently in the rolling text and their role and value, if any, in the protocol.

Surveillance of Publications

Surveillance of publications from scientific and policy journals is an activity that could be relevant to the BTWC in two distinct ways. First, such an exercise could help international authorities keep track of the activities of scientists with skills needed in an offensive BTW program. The treaty parties maintain that basic and much applied research in the biosciences should not be classified.³⁶ Research in biodefense, especially that conducted in government facilities, is expected to be published and openly available. Keeping track of the literature could provide evidence that scientists are engaged in legitimate activities and publishing their results. Conversely, an open or non-classified literature review might show that a well-trained scientist was conspicuously missing from the list of published authors and therefore might be spending time on other activities, possibly including clandestine biological and toxin weapons work.³⁷ Second, this literature review could result in a central repository of scientific and other articles. If all treaty parties were given access to this scientific library, this measure would help fulfill the BTWC’s Article X requirement to facilitate “the fullest possible exchange of...scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes.”

This CBM would go beyond the existing CBM, which encourages parties to publish results and promote the use of knowledge.³⁸ This enhanced version would assign to the future BTWC organization the responsibility to collect and archive publications on an on-going basis. Given the quantity of published information, this task would be one of the more daunting ones facing the BTWC’s yet to be established organization. Since the initiation of the relevant CBM form C in 1986, reporting on this CBM has varied. The low level of responsiveness suggests that additional reporting burdens should not be imposed on states parties in the absence of a compelling justification. Rather, the BTWC organization should be given the resources to survey the literature more ex-

tensively. Creating the capacity within the organization to survey publications in the open literature is likely to be relatively inexpensive and preferable to the proposed CBM.

Surveillance of Legislation

BTWC members are required by Article IV to “take any necessary measures” to assure that the prohibitions set forth in Article I are implemented “within the territory of such State, under its jurisdiction or under its control anywhere.” Nations that have taken measures to ensure implementation of the BTWC domestically have generally done so through legislation making the possession or transfer of biological or toxin weapons a crime. Enacting legislation that criminalizes activities associated with BTW and stipulates penalties according to the severity of the offense could be an indication that countries are taking their BTWC responsibilities seriously. The ability to punish individuals convicted under such legislation could also deter sub-national or terrorist groups from acquiring BTW or make it more difficult for such groups to acquire these weapons. Nonetheless, under the section on CBMs, the rolling text states that the “existence or absence of legislation may not be an indication of compliance or non-compliance.”³⁹ This quote shows considerable ambivalence about the ability of the surveillance of legislation to contribute substantially to confidence in compliance.

The proposed surveillance of legislation CBM is similar to the existing CBM form E, added to the BTWC information exchange in 1991, which requires nations to report data about “legislation, regulations and other measures” relevant to the BTWC. Despite the apparent indifference about this particular measure, surveillance of legislation is under discussion because many countries would need to enact enabling legislation when they ratified the BTWC protocol. The protocol’s proposed Article X on national implementation measures requires states to “take any measures required to implement its obligations under this protocol” and to “inform the Organization of the legislative and administrative measures taken.”⁴⁰ The data that states would provide on this issue could be used to draft model legislation to guide countries still in the process of composing their own legislation. This CBM should be mandatory rather than voluntary. Providing a list of titles of relevant legal measures and, under certain circumstances, a copy of any

legislation enacted relevant to the BTWC would be a trivial task for nations and should therefore be a legal obligation.

Data on Transfers, Transfer Requests, and Production

Reports on transfers of and requests to transfer biological and toxin materials and equipment could increase confidence that supplier states are in compliance with the BTWC’s Article III obligation not to assist BTW proliferation. Furthermore, such an exercise could increase transparency by providing insight into the biological activities of countries without the indigenous capacity to produce dual-use equipment. This data could therefore offer valuable assistance to BTWC investigators who could confirm the uses of biological or toxin materials in peaceful projects and inquire about the location of transferred equipment.

The Ad Hoc Group is considering including reports on actual and requested transfers of equipment and materials as a mandatory compliance measure.⁴¹ The issue of export and import control is a controversial one in the AHG.⁴² Mandatory reporting of transfer data could make a significant contribution to strengthening the BTWC. If the AHG approves a mandatory measure, it would clearly supersede any similar, voluntary CBM.

Multilateral Information Sharing

The umbrella of multilateral information sharing covers a wide variety of activities. Apparently, a number of AHG participants seem to envision the future BTWC organization as a hub of information that parties to the treaty and various international organizations (primarily in the health field) could contribute to and access. The BTWC organization could compile and make available electronically to BTWC members any data related to the BTWC in a broad sense, and to the implementation of the BTWC and its future protocol in particular.⁴³

Taken in total and over time, the multilateral information-sharing CBM could contribute to transparency and help states meet their obligations under the protocol. The downside of this particular CBM is that a surfeit of data could bury the relevant and interesting information in a pile of non-essential data. Creating the capacity within the BTWC organization to accept multilateral information seems worthwhile. However, the organization should not be under the obligation to accept,

catalogue, and make all information available. It should be given the discretion to select only information that it judges to be relevant and likely to be beneficial to others. The capacity to acquire and distribute relevant information electronically is likely to be key to assessing the net benefit of this measure.

Exchange and Confidence-Building Visits

Non-challenge on-site activities, known as “visits” in the rolling text, will form part of the future protocol. Three different types of visits are included under Article III of the protocol, which sets down compliance measures (randomly-selected/transparency visits, voluntary clarification visits, and voluntary assistance visits). States parties have proposed two more types of visits—called “exchange visits” and “confidence-building visits”—explicitly as CBMs.⁴⁴

Exchange Visits

This proposed CBM would have BTWC members voluntarily undertake exchange visits on a bilateral or multilateral basis. The proposed exchange visits would have scientific personnel in fields ranging from agriculture to virology visiting a related laboratory or other facility, for short-term or continuing interaction. The goal of exchange visits is to create transparency regarding biological and toxin research and development activities. Also, because research practices vary from country to country and even within a country, exchange visits could help establish a standard of “usual or customary practice” that could benefit investigators trying to distinguish between typical and atypical activities.

Exchange visits would open relevant facilities to outsiders who, even though they are not trained investigators, might gain an impression over time of whether covert activities were taking place at a certain facility or whether key scientific personnel were engaged in secret research and development. However, the value of this measure to strengthen confidence in compliance would depend on the quality and quantity of the access to people and facilities given to the visiting scientists. Access can be expected to vary from facility to facility. Such visits would be arranged with long notice, and the host country would completely determine access in most cases. Thus, the confidence gained would ordinarily be limited to a specific facility. Nevertheless, the willingness of a country to participate in exchange visits could

be an indication of a positive attitude toward compliance.

Confidence-Building Visits

The concept of confidence-building visits had been included in the rolling text from its onset. During the eighth session of the Ad Hoc Group, South Africa introduced new language developing this concept. During the 20th session, however, the AHG decided that this specific CBM is superfluous and agreed to delete it.

Visits under the CBMs would be more valuable if used to fulfill tasks other than those proposed for the visits listed as compliance measures. For example, long-term contacts between relevant facilities might make possible visits separate from those specified under compliance measures. They would provide additional mechanisms for building confidence in member states’ compliance in cases where the legally binding mechanisms are not considered sufficient by individual member states. In this case, it is likely that the BTWC organization would be a point of contact, coordination, and advice, while all the details of such visits would be developed between the member states concerned. The AHG urgently needs to consider what additional functions CBM visits might fulfill and the necessary operational procedures for them.

Of all the CBMs included in the current rolling text, the visits have the highest confidence-building potential. For this potential to be realized, however, it is necessary to tailor procedures to individual low-level concerns. It seems likely that such visits might have considerable potential in a regional context, with states agreeing among themselves on any details, and then reporting back to the BTWC organization. This way the CBMs can be focused on problem areas, and interested states can adapt the level of “CBM activity” to the level of their concern. The protocol should provide for support for such regional activities, without necessarily specifying detailed written procedures.

When BTWC parties finally agree on the future protocol, no state will be under a legal obligation to comply with it until that state ratifies the protocol. It is possible that a number of BTWC parties will not ratify the protocol quickly. Thus, BTWC parties could fall into two groups, those that are bound by the provisions in the treaty only, and those that have taken on the supplementary obligations of the protocol. Recognizing this, states should be wary of casting off the existing CBMs

in favor of any that may become part of the future protocol. States that do not ratify the protocol should not be relieved from the political obligation to provide data about relevant activities. States that do ratify the protocol might still wish to exchange information with states outside the protocol, and the only mechanisms in existence for them to do so are the CBMs.

BUILDING CONFIDENCE IN COMPLIANCE WITH THE BIOLOGICAL AND TOXIN WEAPONS CONVENTION

The path-breaking CBMs of the CSCE, although multilateral, were primarily intended to reduce tensions in Central Europe between the two superpowers and their allies.⁴⁵ The broader bilateral context and limited number of countries involved made it easier to target facilities and activities of concern. In contrast to CBMs negotiated in contexts like that of the CSCE, the measures established to build confidence in the BTWC are multilateral on a global scale. Building confidence among a much more divergent group, such as the 143 members and 18 signatories of the BTWC, is a more daunting task.

The two states whose non-compliance with the BTWC has been admitted or confirmed—namely Iraq and the Soviet Union—pose as yet unresolved problems for the BTW control regime. These cases have thus far required the use of measures outside the parameters of the BTWC in attempts to uncover information about past programs and to ascertain whether the states are currently in compliance. To increase transparency about the former Soviet program, the three BTWC depositary states, the United States, United Kingdom, and Russia, initiated a trilateral process of reciprocal visits. In Iraq, the United Nations established UNSCOM to verify the elimination, among other programs, of Iraq's BTW program. However, the trilateral process has had very limited success. Similarly, UNSCOM, at the time of its demise, remained unconvinced that Iraq had terminated its biological and toxin weapons program.⁴⁶

Despite some surface similarities, the situations in the two countries are very different. Unlike Iraq, Russia is under no international obligation to submit to inspections, has not been defeated in war, and is a fledgling democracy. Russia formally admitted the existence of the Soviet Union's BTW program in its CBM submission on past offensive biological programs. That the existence of the CBMs provided a low-key mechanism for

Russia to formally admit that the Soviet Union had violated the BTWC is a significant, if little noticed benefit of the CBMs. Beyond the general admission by Russia of an offensive BTW program that continued until 1992, it is worthwhile to note that the Soviet program may have involved officials who currently hold positions of power and responsibility in Russia or other former Soviet states. These circumstances may be an impediment to revealing full information about the past program. Given these significant differences, the approaches for dealing with Russia and Iraq should be reconsidered. This reevaluation should examine the progress, or lack thereof, of the approaches underway, and the options available at a national and an international level to bring the countries into BTWC compliance.

In the face of strong and long-standing suspicions of non-compliance, the BTWC stands as an articulation of the norm against the acquisition and use of biological and toxin weapons. It should provide the international community with the means to force government officials to address compliance concerns. Doing so will likely require measures beyond those negotiated for the BTWC. UNSCOM stands as a stark reminder that international cooperation of long duration, although difficult to sustain, may be necessary to confront egregious violations on a case-by-case basis. The UN Security Council is the appropriate forum at the present time for such decisions because the BTWC in Article VI designates it as the forum for presentation of compliance concerns. After the negotiations of the Ad Hoc Group are successfully completed, the international community will have a far more specialized and effective tool at its disposal—the ability of the BTWC organization to conduct on-site investigations of suspected treaty violations. Other tools such as military force and economic sanctions provide additional options for responding to the proliferation or use of BTW. Implementing a convention that criminalizes under international law the possession, development, production, or use of biological and toxin weapons by individuals is yet another avenue that should be pursued. All of these tools, and the political will to impose them, are needed to confront one of the most dangerous threats to world peace and security.

CONCLUSIONS

CBMs have the potential to provide information unavailable elsewhere to countries making assessments of each others' compliance with arms control treaty obli-

gations. Despite this potential, there is little evidence that CBMs, as defined and implemented in the BTWC, have increased confidence in countries' treaty compliance or in the effectiveness of the BTWC. The tendency of many countries to neglect the politically binding obligations of the CBMs has eroded initial optimism regarding the potential value of CBMs established in 1986 and 1991. Moreover, without some follow-up on the information, states have little incentive to complete accurately, every year, what, for some, may be burdensome reporting requirements.

A BTWC organization, had one been in place during the last 15 years, might have contributed toward making the CBMs more useful. Consistent and timely translation of documents and summaries of the information contained in the submissions might have been particularly helpful to countries with inadequate resources to perform those tasks on their own. A central depository of CBM declaration information would also have facilitated independent researchers' access to the documents, contributing to more in-depth analyses than we were able to provide herein, for example.

CBMs ought to be drafted with care and tailored to activities likely to yield the most relevant information. Although this comment might seem obvious, negotiators should be careful not to approach CBMs as a source of data that would be nice to have, or that might prove useful in the future. Adding to reporting obligations, even if the response is voluntary, could drown the most useful information in a sea of irrelevant facts. Moreover, onerous reporting requirements could lead conscientious countries to default on their obligations. Such actions could lead, in turn, to a general erosion in confidence in the BTWC as a whole.

Before designing CBM obligations, countries ought to consider methods of evaluating CBM performance at the same time that these commitments are imposed. In the past, the review conferences have played a role in evaluating the CBMs under the BTWC. Participants at the Third Review Conference in 1991 thought highly enough of the CBMs to both continue and expand the information exchanges begun in 1986. Nevertheless, even with only a few years of experience with CBMs, the states parties understood that the CBMs were not sufficient. They thus initiated the VEREX process, which led to the current negotiations to strengthen the treaty. Review conferences, moreover, are not equipped to perform the kinds of objective analyses that might be use-

ful in assessing and, if necessary, modifying CBMs. A starting point would be to more clearly define the objectives of the CBMs and define the ways in which the effectiveness of the CBMs might be measured.

Despite their flaws, the CBMs continue to have a role to play in building and sustaining confidence in compliance with the BTWC for certain groups of countries. Building confidence in compliance is generally most likely to be possible with respect to countries that are in the middle range on a scale of confidence. They are not a country's close allies, about whose behavior one would have no suspicions. Neither are they a country's enemies, about whose behavior one would always be suspicious. Confidence in these in-between countries' compliance with the BTWC can be enhanced if they submit accurate, timely information in response to reporting requirements. Similarly, confidence in these countries' compliance can be eroded if they do not submit required information or do so in a slipshod fashion.

Beyond their theoretical benefits, the existing CBMs need to remain a part of the regime for at least two practical reasons. First, states that do not become members of the legally binding protocol should still be under the political obligation to provide data annually. When the BTWC organization comes into being, its role could increase the effectiveness of the existing CBMs, even for states remaining outside the protocol. Second, states that do become members of the protocol should still be able to communicate with BTWC states parties that have not yet ratified the protocol and vice versa. Submitting CBMs is one method of doing so with relative efficiency.

The CBMs that are included in the rolling text so far need further thought and development. Based on our analysis, we have five recommendations:

1. Surveillance of publications should not be an obligation of states; the BTWC organization should have sufficient staff to survey publications through publicly available sources.
2. Providing data on national legislation should be a legally binding obligation for states, not just a voluntary or politically binding one.
3. Proposals to provide data on transfers and transfer requests and on production need further development in light of the outcome of discussions on related sections under Article III of the future protocol. It is clearly preferable to include this measure in some form as a legally binding compliance measure. Moreover, publicly available information on the topic of

transfers and transfer requests could be collected and analyzed by the future organization.

4. Multilateral information sharing might be very helpful in building an overall picture of relevant activities and assisting in implementing Article X obligations. However, it is likely to be effective only if the BTWC organization makes enough resources available to sort and analyze information and selects information according to its relevance.

5. The importance of exchange visits will depend on what types of non-challenge visits are included in the protocol; they can provide additional mechanisms for cooperation in cases where states are not satisfied with the existing legally binding structure. They are especially suitable for long-term engagements between relevant facilities, particularly in a regional context, under the coordination of the future organization.

Perhaps most importantly the performance to date of the existing confidence-building measures has demonstrated that CBMs in isolation cannot be a substitute for a legally binding instrument to enhance treaty compliance. A compliance protocol, with strong measures that reinforce the goals of deterring the acquisition and use of biological and toxin weapons, is a necessary complement to the CBMs. Such a protocol, implemented by an independent organization, is the only way to provide constant professional attention to relevant activities in BTWC member states.

¹ The views expressed in this article are the responsibility of the authors and do not necessarily reflect the views of the organizations with which they are associated. The authors would like to thank the Henry L. Stimson Center, which published and supported earlier work on this topic by Chevrier, as well as Amy Smithson, Brad Roberts, Jeffrey Knopf, and an anonymous reviewer for their helpful comments and suggestions.

² Ronald F. Lehman, "Foreword" in Jeffrey A. Larson and Gregory J. Rattray, eds., *Arms Control: Toward the 21st Century* (Boulder, CO: Lynne Rienner Press, 1996), p. vii.

³ Thomas C. Schelling, and Morton H. Halperin, *Strategy and Arms Control* (New York: The Twentieth Century Fund, 1961), p. 2.

⁴ This definition differs somewhat from Holst's classic definition, "arrangements designed to enhance such assurance of mind and belief in the trustworthiness of states and the facts they create." Johan Jorgen Holst, "Confidence-Building Measures: A Conceptual Framework," *Survival* 25 (January/February 1983), p. 2.

⁵ Richard E. Darilek and Geoffrey Kemp, "Prospects for Confidence- and Security-Building Measures in the Middle East," in Alan Platt, ed., *Arms Control and Confidence Building in the Middle East* (Washington, DC: United States Institute of Peace Press, 1992), pp. 14-15.

⁶ Holst, "Confidence-building Measures: A Conceptual Framework," p. 5.

⁷ For a thorough treatment of the process of confidence building see James Macintosh, *Confidence Building in the Arms Control Process: A Transforma-*

tion View, Arms Control and Disarmament Studies, No. 2 (Ottawa, Canada: Department of Foreign Affairs and International Trade, 1996).

⁸ Ibid.

⁹ Jonathan B. Tucker, "Monitoring and Verification in a Noncooperative Environment: Lessons from the UN Experience in Iraq," *The Nonproliferation Review* 3 (Spring-Summer 1996).

¹⁰ Graham S. Pearson, "The Necessity for Non-Challenge Visits," in Pearson and Malcolm R. Dando, eds., *Strengthening the Biological Weapons Convention*, Briefing Paper No. 2 (Bradford, UK: Department of Peace Studies, University of Bradford, September 1997), available at <<http://www.brad.ac.uk/acad/sbtwc/briefing/bp2.htm>>.

¹¹ The Sverdlovsk anthrax outbreak has an extensive bibliography. An early article on the outbreak is Nicholas Wade, "Death at Sverdlovsk: A Critical Diagnosis," *Science* 209 (September 26, 1980), p. 1501. For an analysis of the effect of the US allegations on the 1980 BTWC Review Conference, see Julian Perry Robinson, "East-West Fencing at Geneva," *Nature* 284 (April 3, 1980), p. 393.

¹² Volumes have been written on "Yellow Rain." An early book on the subject is Sterling Seagrave, *Yellow Rain: A Journey Through the Terror of Chemical Warfare* (New York: M. Evans and Company, 1981). Nearly a decade later see Julian Robinson, Jeanne Guillemin, and Matthew Meselson, "Yellow Rain in Southeast Asia: The Story Collapses," in Susan Wright, ed., *Preventing a Biological Arms Race* (Cambridge, MA and London: The MIT Press, 1990), pp. 220-238.

¹³ Iris Hunger and Marie Chevrier, "Questions of Compliance: The Case of the Biological and Toxin Weapons Control Regime," paper prepared for the 4th International Security Forum, "Coping with the New Security Challenges of Europe," Geneva, November 15-17, 2000 (This paper will be made available on the Geneva Center for Security website, <www.gcsp.ch>).

¹⁴ Reported in John Cushman "US Cites Increases in Biological Arms" *New York Times*, May 4, 1988, p. A9.

¹⁵ C.A.H. Trost, "Statement by Admiral C.A.H. Trost, US Navy Chief of Naval Operations, Before the House Armed Services Committee on the Posture and Fiscal Year 1991 Budget of the United States Navy," 1990.

¹⁶ Second Review Conference of the Parties to the BTWC, Final Declaration, BWC/CONF.II/13/2, (United Nations, 1986), p. 6.

¹⁷ Ad Hoc Meeting of Scientific and Technical Experts From States Parties to the BTWC, Report, BWC/CONF.II/EX/2, Geneva, April 21, 1987, pp. 4-13.

¹⁸ Third Review Conference of the Parties to the BTWC, Final Document, BWC/CONF.III/23 (Geneva: United Nations, 1992), pp. 25-47.

¹⁹ Erhard Geissler, "The First Three Rounds of Information Exchanges," in Erhard Geissler, ed., *Strengthening the Biological Weapons Convention by Confidence-Building Measures*, SIPRI Chemical & Biological Warfare Studies (Oxford: Oxford University Press, 1990), pp. 71-79.

²⁰ The 10 countries that participated every year are Canada, Finland, Germany, the Netherlands, Norway, the Russian Federation, Spain, Sweden, the United Kingdom, and the United States. The three additional states are Estonia, Slovakia, and Slovenia.

²¹ Working Paper presented by Brazil, "Strengthening the BTWC: Elements for a Possible Verification System," Special 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, BWC/SPCONF/WP.4 (United Nations, 1994).

²² These sections update information contained in Iris Hunger, "Article V: Confidence-Building Measures," in Graham S. Pearson and Malcolm R. Dando, eds., *Strengthening the Biological Weapons Convention: Key Points for the Fourth Review Conference* (Geneva: Quaker United Nations Office, 1996).

²³ The information concerning Iraq comes from the 1995 CBM submission, because translations of later CBM submissions by Iraq are not available to the authors.

²⁴ It is not clear from the CBM submission whether these are Canadian dollars or US dollars.

²⁵ Not all of the personnel are dedicated full-time to the program.

²⁶ Third Review Conference of the Parties to the BTWC, Final Document, Annex to Final Declaration on Confidence-Building Measures, BWC/

CONF.III/23 (Geneva: United Nations, 1992), p. 27.

²⁷ US Arms Control and Disarmament Agency, *Threat Control Through Arms Control*, Annual Report to Congress, 1998 (Washington, DC: US GPO, November 9, 1999). The ACDA reports for 1995, 1996, and 1997 are available at <<http://dosfan.lib.uic.edu/acda/reports1.htm>>.

²⁸ Fourth Review Conference of the Parties to the BTWC, Final Document, BWC/CONF.IV/9 (Geneva, 1996), p. 19.

²⁹ For details see Ken Alibek with Stephen Handelman, *Biohazard: The Chilling True Story of the Largest Covert Biological Weapons Program in the World—Told From Inside by the Man Who Ran It* (New York: Random House, 1999); and Amy E. Smithson, *Toxic Archipelago: Preventing Proliferation from the Former Soviet Chemical and Biological Weapons Complexes*, Report No. 32 (Washington, DC: The Henry L. Stimson Center, December 1998), also available at <<http://www.stimson.org/cwc/toxic.htm>>.

³⁰ It is worth remembering that although Iraq signed the BTWC in 1972, it ratified the BTWC only in 1991 as one of the conditions of the cease fire agreement following the Gulf War. Strictly speaking, Iraq could not be in violation of the BTWC until it became a member well into 1991. Nevertheless, even signature without ratification obligates countries not to undertake activities that are fundamentally at odds with the letter and spirit of the signed instrument. An excellent summary of the information on Iraq's biological and toxin weapons program is contained in Raymond A. Zilinskas, "Iraq's Biological Weapons: The Past as Future?" *Journal of the American Medical Association* 278 (August 6, 1997), pp. 418-424. For more detailed information on Iraq's program see: United Nations Security Council, Letter dated 25 January 1999 from the Executive Chairman of the Special Commission established by the Secretary-General pursuant to paragraph 9 (b) (i) of Security Council resolution 687 (1991) addressed to the President of the Security Council, S/1999/94, 29 January 1999.

³¹ Special Conference of the States Parties to the BTWC, Final Report, BWC/SPCONF/1 (Geneva, 1994), p. 10.

³² Ad Hoc Group of the States Parties to the BTWC, *Procedural Report of the Ad Hoc Group 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*, BWC/AD HOC GROUP/52 (Part I), Geneva, 11 August 2000, Annex I, "Rolling Text of a Protocol to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction" (hereinafter referred to as "rolling text"), pp. 29-38.

³³ See for example, Pearson, "The Necessity for Non-Challenge Visits."

³⁴ A group of experts, known as VEREX, which met from March 1992 to September 1993, had also evaluated these and other proposals. See: Ad Hoc Group of Governmental Experts to Identify and Examine Potential Verification Measures from a Scientific and Technical Standpoint, Report, BWC/CONF.III/VEREX/9 (Geneva: United Nations, 1993).

³⁵ CBMs are addressed in the rolling text in Article VIII and Annex G. Rolling text, pp. 112 and 217-227.

³⁶ Third Review Conference of the Parties to the BTWC, Final Document, BWC/CONF.III/23, Part II, Annex, (Geneva: United Nations, 1992), p. 39.

³⁷ Legitimate reasons certainly exist for scientists to be absent from a list of published authors.

³⁸ See CBM form C in Third Review Conference of the Parties to the BTWC, Final Document, BWC/CONF.III/23, Part II, Annex, p. 39.

³⁹ Rolling text, p. 219.

⁴⁰ Rolling text, p. 127.

⁴¹ Rolling text, pp. 37 and 74-77.

⁴² Some countries oppose export controls such as those imposed by the members of the Australia Group on the grounds that they are discriminatory and inhibit economic development. They would prefer that any trade restrictions on biological agents and toxins as well as equipment become part of a negotiated agreement. Australia Group members, on the other hand, think their informal approach is more effective at hindering proliferation because the Australia Group controls its own membership and can deny export licenses to any country thought to be harboring a BTW program. See Amy E. Smithson, "Separating Fact from Fiction: The Australia Group and the Chemical Weapons Convention," Occasional Paper 34 (Washington, DC:

The Henry L. Stimson Center, March 1997).

⁴³ See Working Paper by Brazil, "Strengthening the BTWC: The Next Steps," BWC/SPCONF/WP.5 (Geneva: United Nations, 1994), for a discussion of the merits of a proposal to assist countries in the compilation of data for submission under the CBMs.

⁴⁴ While some strict constructionists of the term CBM may not think that on-site visits constitute activities normally thought of as CBMs, we take an expansive view of the term. Moreover, these visits are explicitly contained in the CBM portion of the rolling text.

⁴⁵ See, for example, Richard E. Darilek, "East-West Confidence-building: Defusing the Cold War in Europe" in Michael Krepon, ed., *A Handbook of Confidence-building Measures for Regional Security*, 2nd ed. (Washington, DC: The Henry L. Stimson Center, January 1995), pp. 13-14; and Jeffrey D. McCausland, "Conventional Arms Control," in Jeffrey A. Larsen and Gregory J. Rattray, eds., *Arms Control: Toward the 21st Century* (Boulder: Lynne Rienner Publishers, 1996).

⁴⁶ Hunger and Chevrier, "Questions of Compliance: The Case of the Biological and Toxin Weapons Control Regime." The status of UNSCOM's BTW verification activities is summarized in detail in UNSCOM's report "On the Current State of Affairs with Respect to the Disarmament of Iraq's Proscribed Weapons," UN Security Council, S/1999/94, January 29, 1999. This report also contains detailed information about the activities in the Iraqi BTW program and weapons and agents produced.