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The Sword of Damocles: ever lasting bio-threat

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The views expressed are only those of the author

Abstract :

Biological warfare has been applied for centuries. The present strategic trends illustrate the importance for early warning systems and contingency planning to contain the spread of new diseases or bio-weapons. A comprehensive approach to provide the international community with both a non-proliferation regime as well as resilience against bio-terror is formulated.

This paper has been written in a series of focus papers comprising other proliferation issues as well as a research paper in the same field of research.

Key words: bio-terror, infectious disease, DIM, non-proliferation.

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INTRODUCTION

Thucydides described the 27-year lasting Peloponnesian war between Athens and Sparta: ever since ancient history the primary target in conventional war was the economic capacity of the enemy. The destruction of crops and abduction of cattle were amongst the major activities of this war. Dead bodies and animal carcasses were used to infect water wells, demonstrating the effectiveness of biological weapons in wartime. These examples were known, read and applied for ages since then. From the 20th century onwards, biological weapons were designed on purpose. Soon the military focused on the issue, starting by the Japanese and the Germans in 1918. The United Kingdom and the United States soon followed: Pandora's box was opened for the proliferation of biological weapons. Even after the signature of the Geneva Convention, which prohibits the use of chemical and biological weapons, many covert weapons programs included a biological part.

In 1972, the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons was opened for signature. It entered into force officially in March 1975, but even then Nations continued to develop offensive biological capacity, amongst which Russia and Iraq. Article I of the convention states that "Each State Party...undertakes never...to develop, produce, stockpile or otherwise acquire or retain microbial or biological agents or toxins, ...that have no justification for prophylactic, protective or other peaceful purposes."² Hereby, the Biological and Toxin Weapon Convention (BTWC) allows for research in the framework of military defense capacity, such as vaccines against biological weapons. The smallpox-virus, for example, scientifically certified to be eradicated in 1979, is still stockpiled in both Russia and the United States in order to retain a Variola stem intended for defensive research.

Both conventional and unconventional terrorist attacks in recent years, remind us of the additional factor of non-state actors in security issues. The attacks in the Tokyo subway in 1995, add the frightening dimension of the possible use of Weapons of Mass Destruction (WMD): between 1990 and 1995, the Aum sect is believed to have launched 17 attacks, from which seven were attempted attacks with biological agents³. Some report the same group attempted to obtain the deadly Ebola Zaire virus to be used as a weapon⁴. In its' final report, the Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, states that "it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013. The Commission further believes that terrorists are more likely to be able to obtain and use a biological weapon than a nuclear weapon."⁵ The threat exists and will remain, so we should learn to cope with it.

² Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, Article I.

³ Chronology of Aum Shinrikyo's CBW Activities, *Monterey Institute of International Studies*, p.1.

⁴ Japan's Doomsday Cult Sought Ebola for Weapon, *Reuters World Service*, 24 March 1996.

⁵ Graham, B., et al., *World At Risk, The report of the commission on the prevention of weapons of mass destruction proliferation and terrorism*, Vintage Books, December 2008, p.xv.

1. PRESENT TRENDS AND CAPACITIES

The list of existing infectious diseases impacting on the human organism is huge, and some are still to be discovered. Since the sequencing of genomes, however, scientists have gained a lot of knowledge on activities of these micro-organisms. The emergence of biotechnology, allowing the modification of the structure and/or function of the target organism has become a double-edged knife: in principle, biotechnology allows to cure a large variety of diseases with less side effects than any medicine would produce. However, this technology is time-consuming and expensive, thus it can and will not be applied for diseases with an acceptable existing treatment. More important, however, is the possibility to design an infectious agent from scratch, capable of provoking disease in a target organism: targets can be crops, which reminds us of the wars of ancient history, as the effect on the economy is the same. Second, they can be targeted on humans, whether they are soldiers or civilians. In such a case we find ourselves in the example of the first infections of water wells with organisms that are much more powerful and with the potential to become huge outbreaks or pandemics.

Globalization has made the situation even worse: nowadays, an infected person can spread disease over the world in hours traveling by plane. This brings us straight to the problem of the vectors for pathogens, hence weaponization. It is not an easy task to deliver a bio-agent to the area where one wants it to get activated: most organisms are killed when not stored in appropriate conditions of, for example, temperature, pressure and conditioning. Furthermore, the idea of spreading an organism with an explosive device or a rocket is even more susceptible for failure: blast or temperature variances of a delivery system as a missile or rocket can be enough to destroy an organism. On the other hand, existing vectors such as rodents or insects, are as hazardous in use for the aggressor than for the targeted population. However, for the terrorist who does not care for his own life, this is not a major issue: it can still become a problem if the pathogen intended to kill abroad, comes back to you, multiplied in quantity and strength due to an induced pandemic. The result can be of the same nature as the flu pandemic in 1918 causing more victims than the Great War itself.

Apart from the design of a complete organism, humanity has gained the science to alter defence mechanisms. This technique, initially based on vaccination in order to enhance the immune response of humans or cattle against infectious disease, has evolved to the possibility to tune immune response for therapeutic purposes. Obviously, once more we face a double-edged knife: if a system can be tuned to react upon infection, it can evenly be shut down in order to be susceptible to the weakest micro-organisms.

The question we have to consider is whether a non-state actor would be able to acquire these techniques, i.e. can we reasonably expect biological proliferation to non-state actors? Basically, the answer is the same as in the case of nuclear or radiological terrorism. Nuclear capacity is held by Nuclear weapon States. The same goes for biological weapons. However, the traceability of nuclear weapons and vectors is organized as well as can be with the existing limitations on treaties. The problem with biological agents is that all material and supplies are dual-use goods, which means they are hard to detect in the frame of an active bio-weapons program. On the other hand, one must not expect a non-state actor to design an organism in his backyard. Rather, he will try to obtain it from an existing production facility either legitimately or by theft. Referring to the case of nuclear weapons, we have to consider the possible transfer of bio-agents by illicit networks established in States owing a biological weapon capacity. According to William R. Clark "the US military gave up bio-weapons 30 years ago. They're too undependable; they're too hard to use; they're too hard to make... it's not

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practical; it's never going to work."⁶ This does not mean that prototype or ancient stockpiles of bio-weapons can not be acquired at all: as was illustrated by the Khan-network, delivering nuclear technology to Iran and North Korea, and non-state actors amongst others⁷. This could also be the case of the aforementioned bio-weapons.

Taking these points into consideration, one can have a general idea of possible pathways for the effective use of biological agents. First, as can be assessed in hospitals worldwide, microorganisms, resistant to antibiotics, anti-viral medicines or vaccines constitute an enormous sanitary issue. Second, genetically modified organisms, can possibly have acquired enhanced virulence, infectious capacity, or capacity to disrupt natural or acquired immunity. Third, microorganisms should be capable to be transferred, that means stockpiled in a (living) vector before delivery. Most resistant agents to date are spores of *Bacillus anthracis*, causing anthrax. The example of the letters addressed to US Congress in 2001 and the subsequent panic wave is still in the collective memory. Lastly, an effective organism should be invisible to early warning systems, resistant to early detection and prophylactic measures.

2. INTERNATIONAL ENGAGEMENT AGAINST INFECTIOUS DISEASES

Only a global and common approach of infectious disease can be the solution for the permanent bio-threat: as explained, the outcome of a biological attack can hardly been distinguished from a natural outbreak, except in cases of synthetic organisms. International cooperation will therefore allow to create the necessary leverage and sufficient funding capabilities to tackle sanitary problems and start monitoring systems all over the world.

At the G8 summit of Saint-Petersburg on July 16, 2006, a series of initiatives have been taken in that direction. Disease, whether it originates from bio-terror or natural outbreaks, exacts heavy toll on both economy and society worldwide: this burden can only induce harsher consequences in today's experienced period of economic decline, especially in least developed countries. The awareness that initiatives had to be started in a comprehensive and global manner, led to a certain number of decisions⁸:

- (1) Improved international cooperation on surveillance and monitoring of infectious diseases, information and sample sharing.
- (2) Intensification of scientific research with the special involvement of scientists from developing countries.
- (3) Support to prepare for a global outbreak of avian influenza and a new worldwide influenza outbreak in humans.

⁶ Death from life, in *NBC International*, Surrey House Corporate Communication Ltd., January 2009, p6-7

⁷ Sokolski, H., *Pakistan's nuclear future: worries beyond war*. DOD, Strategic Studies Institute, Januari 2008, pp.13-30.

⁸ G8 summit official website: *Fight against in factious diseases*, St.Petersburg, July 16, 20.

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(4) Special attention for existing major diseases as HIV/AIDS, tuberculosis and malaria and: emphasis lies on two simultaneous approaches of adequate treatment by 2010 and (renewed) vaccination campaigns with the aim of final eradication. The efforts in these domains are combined in a Global Fund, created in 2001.

(5) Improved access to prevention and treatment and promote innovative clinical research.

(6) Increased efforts to mitigate the consequences of outbreaks through coordination and capacity building.

These goals fit in a general approach that can be summarized in three main pillars. First, enhanced R&D is needed for the development of novel treatment. Second, prophylaxy and treatment to constraint existing infectious outbreaks in the least developed countries, but also to constraint re-emerging diseases in Western Europe due to the loss of immunity, against tuberculosis for example. Third, detection, identification and monitoring (DIM) as a permanent alerting system that is required for immediate action in case of bio-threat, whether or not from terrorist origin.

These goals require funding, as illustrated in table 1 which lists the means allocated in the foresight of the realization of the goals of the Global Fund (see decision 4 of the G8 summit goals):

Table 1: Funding efforts to the Global Fund by 2006.

| COUNTRY | AMOUNT |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| United States | \$15 billion over 5 years to support international HIV/AIDS programs \$90 million in 2006 to tuberculosis programs \$1,2 billion over 5 years for malaria prevention and treatment |
| United Kingdom | £360 million between 2002 and 2008 |
| Canada | C\$250 million in 2006 |
| European Commission | € 522 million since creation of Global Fund € 90 million allocated in 2006 |

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| | |
|---------|---------------------------------------------------------------------------------------------------------------------------------------|
| Russia | intends to reimburse to the Global Fund till 2010 near US\$270 million, which were distributed to fund projects in Russian Federation |
| Japan | pledged to contribute US\$ 500 million |
| Italy | € 460 million in the period 2004-2007 |
| Germany | € 300 million on national prevention and control |
| France | € 225 million in 2006; € 300 million in 2007 |

It is worth mentioning that the Global Fund provides more than 20 per cent of international funding to fight AIDS, as well as two-thirds of international funding to fight malaria and tuberculosis: it needs between US\$ 12 billion to US\$ 18 billion for the period 2008-2010⁹. It is highly doubtful if the present economic situation will allow for the commitments to be fulfilled. Furthermore, these initiatives are only the top of the iceberg to cover the complete spectrum of diseases involved in bio-threat, especially the most dangerous and accessible ones to non-State actors.

Therefore, in the spirit of the decisions of the 2006 G8-summit, additional initiatives have been undertaken by international organizations. The UN Food and Agriculture Organization (UN FAO), has played an important role to link animal and plant disease by the establishment of an Emergency Prevention System for Transboundary Animal and Plant Pest Disease with special attention to the economic impact on crops and cattle. Therefore, the Global Information and Early Warning System (GIEWS)¹⁰ can play an essential role in the early stages of a bio-terror attack on food production capacity.

The World Organization for Animal Health (OIE), has proven its importance during the Severe Acute Respiratory Syndrome (SARS) epidemic and the outbreak of avian flu: as countries can not prevent the spread of zoonotic diseases across their borders, an international body needs to coordinate and help to establish effective governance in veterinary services. Therefore, the United States were

⁹ The Global Fund Welcomes Large 2008 Financial Contribution From Japan, press release February 28, 2008 found at http://www.theglobalfund.org/en/pressreleases/?pr=pr_080229 accessed February 27, 2009.

¹⁰ <http://www.fao.org/giews/english/index.htm> accessed February 27, 2009.

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assisted by the Performance, Vision and Strategy (PVS) tool: the main goal here is to identify eventual shortcomings in applying international OIE standards for the delivery of veterinary services.¹¹

The World Health Organisation (WHO) agenda focuses on issues that have a direct impact on the governance of health problems in Africa in the first case as most of the health care problems are centralized there¹². Actually, it is the aim of the WHO to

- (1) promote development,
- (2) foster health security,
- (3) strengthen health systems,
- (4) harness research, information and evidence,
- (5) enhance partnerships,
- (6) improve performance.

With this agenda, it turned out that an overlap existed between the WHO strategies on health security and the conclusions of the Foresight report on the detection and identification of infectious diseases¹³: the need for a more proactive approach to the development of DIM- systems, became apparent. This is in complete accordance with the need for the development of such systems in the frame of bio-terror incidents: permanent, robust and reliable detection systems are not only needed on the African continent, but in all cities prone to acts of bio-terrorism.

A first initiative was launched by the Bush administration in the form of the Biowatch program. In 2003, the nation's first early warning network of sensors to detect biological attack was deployed¹⁴ under the responsibility of the created Department of Homeland Security (DHS). The problem of the actual DIM-systems is the often recurrent problem of high false alarm rates (false positives or false negatives) inherent to the limitations of present technology. Furthermore, a lot of criticism burst on the technological limitations of the Biowatch filter system by American Congress¹⁵. Apart from technology, the House of Representatives reported inconsistencies in the exploitation of the output-data¹⁶. This

¹¹ The new tool for the evaluation of veterinary services using OIE International Standards of quality and evaluation found at http://www.oie.int/eng/oie/organisation/en_vet_eval_tool.htm accessed February 27, 2009.

¹² The WHO agenda found at <http://www.who.int/about/agenda/en/index.html> accessed February 27, 2009.

¹³ Infectious diseases: preparing for the future, in: *Findings of the Foresight project*, 26 April 2006.

¹⁴ State of the Union Address," Executive Office of the President, The White House, January 28, 2003, found at <http://www.whitehouse.gov/news/releases/2003/01/20030128-19.html>.

¹⁵ Congressional Research Service Report No. RL 32152, *The BioWatch Program: Detection of Bioterrorism November 19, 2003*, retrieved [October 22, 2007](#)

¹⁶ U.S. House of Representatives, Committee on Government Reform, Subcommittee on National Security, *Emerging Threats and International Relations, Following Toxic Clouds: Science and Assumptions in Plume Modeling*, 108th Congress, June 2, 2003.

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example demonstrates that DIM-systems have a long way of R&D before an affordable and operational system, fulfilling all requirements, would be available.

The European Centre for Disease Prevention and Control (ECDC) was established in 2005 in Stockholm, Sweden. This centre became responsible for the implementation of a comprehensive European strategy of observation and reporting in the frame of emerging outbreaks for 2013¹⁷. The publication of the green book of the European Commission dealing with both major aspects to counter a bio-threat, being biosafety and biosecurity, was the onset for the ECDC to fulfill all requirements in this field as from 2008 onwards¹⁸.

The assessment is that at different levels of governance, initiatives are taken, either bilaterally, either in an international context. But for sure, not all of these bodies match each others decision making process. This problem can also be found on the feed-back at national levels were information systems are often dead-ended or duplicated without a comprehensive follow-up by a dedicated national body such as a national crisis centre.

3. THE NON-PROLIFERATION REGIME

As seen before, multiple levels of governance have taken initiatives to counter proliferation of WMD. The UN Biological and Toxin Weapon Convention (BTWC) entered into force in March 1975, based on the Geneva Protocol of June 17, 1925. Since then, 171 signatories were recorded from which 155 ratified the Treaty. The main drawback, as compared to other Treaties such as the Non-Proliferation Treaty (NPT) or Chemical Warfare Convention (CWC), is to be found in the total absence of any verification protocol. The existence of such a protocol is not an easy task since most, if not all, agents of concern, are dual-use listed items. However, this is similarly the case for the Chemical Warfare Convention (CWC): this Convention lists all chemicals of concern (annex on chemicals), as well as terms and conditions for verification ("verification annex"). The following Review Conferences were intended to strengthen the original Convention¹⁹.

In 1994, an *ad hoc* group was constituted with the aim to draft verification measures to the Convention. Four areas were to be negotiated:

- (1) Provide a clear definition of terms and objective criteria.
- (2) Incorporate and enhance confidence building measures.
- (3) Agree upon measures to promote compliance.

¹⁷ ECDC strategy found at <http://ecdc.europa.eu/>

¹⁸ EC 11951/07, July 2007.

¹⁹ Review Conferences took place in 1980, 1986, 1991, 1996, 2001, 2002 and 2006.

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(4) Agree upon measures to ensure the effective implementation of Art.X.²⁰, which focuses on the peaceful use in the field of bacteriology and toxin sciences on the one hand, and both the economic and technological development on the other hand.

In July 2001, the US rejected the draft protocol of the *ad hoc* group stating that it would endanger the security of biotechnological and pharmaceutical secrets. This argument does not hold, since verification measures and on site inspections do not include the verification of a complete production process: the sampling and analysis of production output can deliver sufficient information on the peaceful character of the inspected site. That same year, the US redrew from the Anti-Ballistic Missile (ABM) treaty, to take a stance after the 9/11 attacks.

The Sixth Review Conference was concluded in 2006: it was decided to hold four annual meetings of State Parties and Experts between 2007 and 2010. The 2007 meeting promoted effective action to enhance national implementation, including enforcement of national legislation and cooperation between national agencies. Some argue that national legislation, and bio-criminalization was needed in the first place²¹. What is agreed upon is the need for bilateral or multilateral comprehensive measures for the enforcement of the Biological and Toxin Weapon Convention (BTWC). To this aim, a common basis of national definitions would be required. Also, a common way of law enforcement would have to be set in place. Reference laboratories would be responsible for the sharing of records of Biological and Toxin Weapon Convention (BTWC) violation incidents: to this aim, a roster of experts and laboratories, accompanying guidelines and procedures were elaborated by the end of 2007. To this date, 197 biological experts from 34 countries and 59 analytical labs were listed. In the “Plan of Action” of its’ Counter Terrorism Strategy²², the UN General Assembly laid the foundations for the development of a bio-incidents database: this database would serve as a platform to centralize detailed technical information in bio-incidents in order to prevent bio-terrorism²³. Unlike the data provided in the International Atomic Energy Agency (IAEA) Illicit Trafficking Database of nuclear and radiological material, this list should include more detailed information and measures for improved approaches in the future.

In August 2007, the EU-Presidency issued a document resuming the priorities of the EU in support of the Biological and Toxin Weapon Convention (BTWC)²⁴. First, the international system of non-proliferation should be strengthened. Second, the universalisation of multilateral agreements should be pursued. Third, the strict implementation of and compliance with these agreements should be reinforced. Fourth, there should be close co-operation with key partners. Finally, assistance should be provided to third countries.

The work during the Convention of December 2008 focused on two major issues for the survival of the Biological and Toxin Weapon Convention (BTWC) Non-proliferation regime. First, measures for improvement of biosafety and biosecurity (including laboratory safety and security of pathogens and

²⁰ The entire text of article X can be found in reference [19].

²¹ Kellman, B., *Bio-Criminalization : Non-proliferation, Law enforcement and Counter-Smuggling*. American Society of International Law, October 2002, p.10

²² A/Res/60/288 of 8 September 2006.

²³ BWC/MSP/2007/WP.1 of December 7, 2007.

²⁴ BWC/MSP/2007/MX/ WP.1 of August 2, 2007

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toxins) were discussed. Second, it dealt with oversight, education, awareness rising and adoption and/or development of codes of conduct with the aim of preventing misuse in the context of advances in bio-science and bio-technology research with the potential of use for purposes prohibited by the Convention²⁵.

4. POLICY RECOMMENDATIONS

In order to guarantee the continuity of the steps taken until 2008, a risk assessment should be used to focus on the biological issues that are of prime importance to counter bio-threat: the agents that are most likely to be used by non-state actors have to be listed, assessed and appropriate conservative measures have to be taken. To this end a lot of work has been done already by the European Union²⁶, the CDC (Atlanta)²⁷ and the WHO²⁸ respectively. These measures should be merged at UN-level.

Unlike the International Atomic Energy Agency (IAEA), as UN-watchdog in the frame of the Non-Proliferation Treaty (NPT), and the Organisation for the Prohibition of Chemical Weapons (OPCW), as sentinel for the application of the Chemical Warfare Convention (CWC), there is no permanent body which reports the correct appliance of the Biological and Toxin Weapon Convention (BTWC) to the UN: a temporary structure was set up during the first Gulf War and in its aftermath to follow up inspections in search of WMD. This UNMOVIC structure was dismantled in 2008. A permanent structure (BTWC Agency) would allow for a better continuity and coordinated action.

Strengthening the Biological and Toxin Weapon Convention (BTWC) regime by systematic inspection protocols and safeguards agreements, by analogy with the Non-Proliferation Treaty (NPT) regime for nuclear matters, would allow for a solid anchoring of emerging initiatives as, for example, the roster of experts and laboratories. International coordination could also be favoured by a common ground of understanding of definitions and applications based on UNSCR 1540 and a safeguards agreement to the Biological and Toxin Weapon Convention (BTWC): this implies a top-down approach instead of the bottom-up approach promoted by some State Parties. Bottom-up approaches would need a continuous recurrent loop to convene on definitions of terms and their bilateral or multilateral extension.

Measures for quality control could hold international labels of compliance to the Biological and Toxin Weapon Convention (BTWC) in all applications of biotechnology and pharmacology. In this framework of quality control, the secrecy of production processes would be guaranteed, since the Biological and Toxin Weapon Convention (BTWC) compliance would only require the production output

²⁵ Avramchev, G., *Bringing biologists on board : Looking back on the Work of the Biological Weapon Convention in 2008*. Statement of the Chairman of the 2008 Meeting of the Biological Weapons Convention, China, 7-8 December 2008.

²⁶ EC/534/2003 of 17 July 2003.

²⁷ Biological and Chemical Terrorism: Strategic Plan for Preparedness and Response. *Recommendations of the CDC Strategic Workgroup*, April 21, 2000, pp.1-14.

²⁸ Public health response to biological and chemical weapons: WHO guidance (2004) found at <http://www.who.int/csr/deliberdemics/biochemguide/en/index.html> accessed March 02, 2009.

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to be checked instead of the complete production process. Additionally, separate inspection teams for biosafety and biosecurity measures respectively, could allow for a reduced number of people having access to sensitive information in each field, which could include a separate reporting procedure.

As an extension of quality control, bio-organisms could be tagged genetically to favor traceability. Traceability is an essential part in quality control measures. Also, it allows for the identification of the source in case of theft or misuse from laboratories or research facilities. Furthermore, it constitutes an essential element in the verification of the chain of custody, hence the importance of genetic tags as an element contributing to enhance biosafety and biosecurity.

R&D efforts should be enhanced in order to develop equipment with acceptable output (that is with reduced false positive and false negative alerts compared with today's equipment) for detection and early warning. Sensor fusion, in addition to information gathering would allow the creation of a worldwide network for the early detection of an emerging bio-threat. Even in times of economic decline, R&D should remain a priority since it allows for investments that provide a rapid return of investment. The collection of data worldwide should be a task for centers as the ECDC (Stockholm) or CDC (Atlanta). Other CDC's could be established on each continent to act as a point of contact between the UN Biological and Toxin Weapon Convention (BTWC) Agency and Member States. Therefore, all experts, laboratories and biosafety/biosecurity officers, should be registered nationally and in their responsible CDC. As such, they hold a legal responsibility for eventual breaches of the Biological and Toxin Weapon Convention (BTWC) regime. Additionally, this would allow for an exhaustive list of commercial and military activities in the field of biotechnology and pharmacology.

5. CONCLUSION

The Biological and Toxin Weapon Convention (BTWC) in its actual form is inadequate, but the efforts of the yearly Conventions, will hopefully allow, in the end to obtain a regime strengthened by protocols, procedures and networks. These Conventions are equally important to convene on a common understanding of definitions at international level and for national application in, for example, law enforcement. The Non-Proliferation Treaty (NPT) suffered the same shortcomings before the entry into force of safeguards agreements, and even then it was proven that Member States (Iraq for example) could pursue covert weapons programs. An additional protocol was needed for increased supervision on nuclear matters: so much the more, this will be true for a Convention dealing with dual use materials and equipment.

The yearly Conventions for Experts and Member States which runs till 2010 will have to frame a comprehensive Biological and Toxin Weapon Convention (BTWC) for the BTWC Review Conference of 2011: if a common ground of understanding can not be reached by then, the Nonproliferation regime for biological weapons will be in danger. Therefore, bio-threat should not necessarily be a permanent Sword of Damocles: the outcome will both depend on the results of the Review Conference on the one hand, and the determination and resilience of Member States to cope with non-state actors' activities in the field of bioterror on the other hand.

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- [19] Art.X of the the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons also known as the Biological and Toxin Weapon Convention states:
- (1) The States Parties to this Convention undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes. Parties to the Convention in a position to do so shall also cooperate in contributing individually or together with other States or international organizations to the further development and application of scientific discoveries in the field of bacteriology (biology) for prevention of disease, or for other peaceful purposes.

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(2) This Convention shall be implemented in a manner designed to avoid hampering the economic or technological development of States Parties to the Convention or international cooperation in the field of peaceful bacteriological (biological) activities, including the international exchange of bacteriological (biological) agents and toxins and equipment for the processing, use or production of bacteriological (biological) agents and toxins for peaceful purposes in accordance with the provisions of the Convention.