

Original Research Paper

# “Bio-Hybrid Threats and Strategic Biosecurity in the Age of Bio-Globalization: The Case Study of Biological Weapons and Bioterrorism”

Athanasios Ilias Bozinis

Department of International and European Studies, University of Macedonia-Greece and  
SAIS Europe-John Hopkins University

Article history

Received: 03-08-2021

Revised: 09-11-2021

Accepted: 17-11-2021

Email: bozinis@uom.gr

**Abstract:** The end of the Cold War and the expansion of globalization to most of the planet has brought about significant changes in the field of International Relations. National economies are more interdependent than ever, the threat of global nuclear war has now decreased significantly and new technologies currently form the cornerstone of world growth, while at the same time changing the conduct of armed conflict. This study, with the use of a methodological research tool called “Contemporary Narrative” attempts to analyze the contemporary problems resulting from the possible use of new technologies as weapons of mass destruction and more specifically, the strategic use of modern biological weapons as part of “Bio-Hybrid Threats”. The initial historical overview of the use of biological weapons is followed by an analysis of modern global technological-biotechnological developments within the context of global bioterrorism.

**Keywords:** International System, Globalization, Bio-Hybrid Threats, Bioweapons, Strategic Biosecurity

## Introduction

In the Oxford Dictionary of Politics, "International Relations" is defined as [a] n academic field that deals with and researches the interactive and interdependent relations between states and generally investigate the function of the 'International System' as a whole. International relation is a broad academic field, which incorporates several other scientific fields and scholarly disciplines including sociology, technological development, international policy, the international economy, history, and law (McLean and McMillan, 2009: 270).

The “International System”, analyzes the “International Actors” which affect and determine moves on the global economic-political and military chessboard.

The main features of the modern international system are expanding globalization and interdependence (Friedman, 2001), increasing competition and regional conflicts, while the states attempt to respond to global challenges-competition and to increase their power and influence, and achieve economic and social development.

In their development effort (s), states attempt to employ and take full advantage of the power indicators they possess.

The five main power indicators in the 21<sup>st</sup> century, which determine the outcome for states are the following:

- 1) Technological
- 2) Demographic
- 3) Economic
- 4) Military and
- 5) Scientific knowledge

## Historical Background

The end of the Cold War between the Union of Soviet Socialist Republics (USSR) and the U.S., in the early nineties (Boniface, 2001: 36-37), created a new, multi-polar international scene characterized by intense geopolitical competition, the liberalization of the global economy (Gilpin, 2009), regional instability due to complex political changes, armed conflict and the emergence of new state powers.

This new multi-polar, a liberal, and highly-interdependent international system with the U.S., at its center (Americanization) (Nye, 2003: 170), gave impetus not only to the free movement of scientists and capital but also to scientific research and innovation, resulting in the development of new technologies and the creation of innovative products and services.

As new global and transnational actors, multinational firms initially formed the main investors in emerging markets and developing states, to increase corporate

profits, obtain cheap labor, direct and low-cost access to raw materials, and conquer the global market.

Along with their investments in developing markets and transition economies, multinationals not only created jobs but also transferred high technology know-how (technology transfer).

But, unfortunately, due to globalization, states have not been able to effectively control the movement of goods and immigration (which, according to some analysts, has resulted in cultural-religious conflict today) (Huntington, 2001: 42) and thus the possibility of accessing and using new technologies was given not only to states but to other groups at a global level.

This resulted directly in global concern about the risk of non-legal use of new technologies and the now-explicit threat to global security, peace, and development.

### *Biological Weapons as Bio-Hybrid Threats*

The globalization of technology and especially the widespread use of Information and Communications Technologies (ICT) resulted not only in the third technological revolution (Technological Revolution), the so-called "Information Society", but also in the gradual integration of national economies, the commercial-geographical expansion of multinational enterprises and increased global interdependence.

But at the same time, the internationalization of research and worldwide scientific cooperation laid the foundations for the development of a host of new technologies, including biotechnology, genetics, nanotechnology, and robotics-Artificial Intelligence (AI). Within a short time, these emerging technologies were not only being employed as main power indicators but today they form a cornerstone of global development (United Nations, 2010).

Although these new strategic technologies were initially the exclusive privilege of states and multinational companies (as regards research, possession, and use), due to globalization and the diffusion of technological knowledge (as well as the ability to discover high-tech materials and create sophisticated laboratories) these technologies have expanded worldwide, sometimes uncontrollably.

Today, the possibility of using weapons of mass destruction (nuclear weapons), appears to be ever more remote, even more, due to increasing international interdependence (Held and McGrew, 2004) and the fact that after a nuclear confrontation, no one will be able to survive on a highly toxic planet with minimal resources to sustain life as we know it.

Nevertheless, states (and unfortunately, not only states) are today attempting to create new and more accurate technological weapons at a lower cost, with a view not only to increasing their regional and global influence in the international system but also to being able to deal effectively with new technological threats.

The terrorist attack of September 11<sup>th</sup>, 2001 on the World Trade Center in New York City changed the conditions and means of military conflict until that time.

Strategic analysts and international relations researchers concluded that due to globalization and the free movement of persons, goods, and services, the borders of states were now more vulnerable to external risks and no national defense system was impenetrable and one hundred percent effective.

For this reason, each state must now be able to ensure appropriate new scientific methods to be able to directly prevent or effectively respond to hostile actions within or outside its borders.

Thus, at the beginning of the twenty-first century and within an internationally competitive system, states were faced with a new challenge: Confronting not only (hostile?), states but groups that possess both conventional weapons as well as more modern ones relying on new technologies which could be used as weapons of mass destruction and strike enemy targets with maximum effectiveness.

Today, biotechnology is at the cutting edge of emerging technologies and as a science with an appropriate combination of biological processes (Molecular Biology, Genetics), it produces products and commercial goods worldwide (agricultural, pharmaceuticals, food, industrial products).

However, the uncontrolled and illegal use of products-services of applied biotechnology poses grave risks for states, citizens, and public health, while raising serious scientific dilemmas (Bioethics) as regards their purposes and use.

In parallel, the modification of living organisms for non-commercial purposes may lead to the manufacture of products to carry out armed conflict by states (biological warfare) or by terrorist groups (Bioterrorism) (Boniface, 2004: 103).

Historically, as regards the use of biological weapons and following the " National Center for Biotechnology Information [NCBI] -the USA, the use of biological weapons is a very old method, which in essence began in 600 B.C., when the use of contaminated corpses and various substances to contaminate drinking water and food was already known to have disastrous consequences for an enemy army (Frischknecht, 2003).

Biological weapons and specifically, the purposeful transmission of contagious diseases were widely employed by European colonists in their wars with the native inhabitants of the New World (North and South America) through the widespread use of the Smallpox virus (Riedel, 2004).

Biological and Chemical weapons were later employed on a large scale in the course of World War I (1914-1919) with disastrous consequences, given that their use resulted in thousands of dead and injured (blind soldiers), while unfortunately, it was at that same time that the technological scientific bases were established for the

widespread use of biological and chemical weapons in future military conflicts (Pruszewicz, 2015).

During the Cold War period (1945-1989) and despite the signing of the 1925 Geneva Protocol prohibiting the use of chemical and biological weapons (but not their construction and their possession) the United States of America and the Soviet Union produced and stored very significant quantities of chemical and biological weapons (Boniface, 2004: 98).

Following the National Security Council's report, "national strategy for countering biological threats" (December 2009), chemical-biological weapons were also used at other times during the twentieth century, the main instances being the following:

- 1984: (Oregon, USA): Poisoning of 751 people with *Salmonella typhimurium* by the organization "Rajneeshee". An action with political ramifications, but without any human loss (the first recorded biological attack in the USA)
- 1990: The religious organization "Aum Shinrikyo" (Tokyo, Japan), sprayed the Tokyo subway with a liquid containing *Bacillus anthracis*, once again but without any human loss
- 2001: Postal letters containing Anthrax spores were distributed in the USA, resulting in 22 people contracting the disease, of whom 5 died
- 2001: US and Allied forces during the war with the Taliban regime in Afghanistan discovered that the terrorist organization al-Qaida was trying to develop biological weapons. Although al-Qaida has suffered a significant loss in its operational military power, there are serious suspicions that it is trying to acquire biological weapons even today (White House, 2009).

### *Global Bio-Hybrid Threats from the use of Biological Weapons*

To the U.S. Centers for Disease Control and Prevention (CDC), the term "bioterrorism" refers to the deliberate release and use of viruses, bacteria, and microbes to cause illness or death in humans, animals, and plants. These agents may be found free in nature, but with the appropriate intervention may become more aggressive, drug-resistant, and spread more rapidly (CDCP, 2016).

The main characteristics of biological-chemical weapons are the following:

- The tactical advantage of biological-chemical weapons is the fact that they are easily produced (in small labs), while their use is silent in comparison to modern military weapons (aggressive rifles or bombs)
- Transferring a biological quantity with viruses can be achieved in small amounts (within small vials) which

are very difficult for specialist anti-terrorist teams or prevention groups to identify

- The potential attacker can achieve his objective through the direct dispersion of contaminants in highly-frequented places (public transport, cinemas, museums) without anyone immediately realizing there has been an attack
- Depending on their composition, biological and chemical weapons may be odorless, colorless and slow-acting (becoming active only after some time has passed) and in this way, they are undetectable not spreading fear or instigating any suspicion of an attack, thus giving the tactical time advantage to the attacker
- In case of a biological attack as part of bio hybrid threats by a mutant virus, unsuspecting victims leaving the point of attack and simultaneously, the point of contamination are automatically converted to time bombs who may be unknowingly spreading the virus a few hours later in their work environment, their family and others before displaying clinical symptoms
- Terrorists using slow-acting biological or chemical weapons can escape arrest after achieving their objective due to the slow release of infectious biological substances and, thus, will continue to pose a threat
- The immediate detection of any biological or chemical terrorist attack requires the most specialized and up-to-date scientific and technological means of identifying them as countermeasures, but these have a high cost of ownership for each state and presuppose a highly qualified scientific personnel
- Most citizens are unaware of how to prevent or respond effectively to biological-chemical attacks, having a resulting state that is poorly informed and prepared for the effective management of biological attacks and crises
- Movements of populations-refugees from war zones can give terrorists the opportunity to transfer mutated viruses to western countries through unsuspecting refugees, thus turning them into living biological time bombs
- Biological and chemical weapons can be cheaply manufactured; all that is required is the appropriate material-technical infrastructure and specialized scientific personnel
- Finally, biological attacks may be carried out not only against people but also against animals and plants, resulting in risks to both livestock farming and cultivatable lands in a state. A biological attack (infectious virus) on a state's livestock farming and agricultural production would immediately result in an economic crisis with uncontrolled consequences, followed by an automatic increase in the price of food, and imports, possible social unrest, and finally, political instability

The Islamic State of Iraq and al-sham or Islamic State of Iraq and Syria (ISIS), due to illegal oil trading in regions of Syria and Iraq, has the economic potential to fund the related research, development, and use of biological and chemical weapons (The Independent, 2015).

According to the online newspaper Huffington Post, after the terrorist attacks in Paris in October 2015, during a speech to the French National Assembly French Prime Minister Manuel Valls announced that there was a serious risk of terrorist attacks with chemical or bacteriological weapons, adding that the key weapon and objective (of terrorists) is terror (The Huffington Post, 2015).

Concurrently, it was stressed that European states must be on continuous alert to confront such a threat, while it was noted that the "European Institutions" are making every possible effort to avoid such a terrorist attack on European soil, through a continuous exchange of information between/among European states (CNNG, 2015).

Secret military scientific research has argued that there are serious fears and concerns about the use of the Ebola virus by Islamic "lone wolves" and for this reason, both the British and US governments are constantly conducting scenarios and exercises for dealing with modern biological weapons within the context of international security (The Guardian, 2015).

## Conclusion

The end of the Cold War during the 1990 s and the dissolution of the Soviet Union resulted in the global economic, political and military dominance of the United States of America.

American multinationals have created a new field in the global economy, resulting in the reduction of production costs, globalization of production, broadening of global competition, and expansion of globalization as a process that unifies the economies of states.

Another basic characteristic of the post-Cold War international system was the emergence of new state economic forces; in particular, on the part of Asian countries and regional conflicts due to uneven development and political interests.

The new technologies used by states as a power and growth factor have formed a cornerstone of globalization, while at the same time they have been employed within the context of international cooperation to solve serious problems in the global community, including poverty, world health, pharmaceutical care and adequate nutrition for weaker states and their inhabitants.

Today, however, new technologies are not only an advantage for states; due to the globalization of technology, they now extend to other "international actors" including global civil society, multinationals, technological elites, interest groups, individuals, and pressure groups.

Biotechnology is a cutting-edge technology widely used today to create innovative commercial products and services. Nevertheless, now-expanded biotechnological-scientific knowledge can field rivalries and illegal exploitation, to use biotechnological innovations for the creation of new more efficient, and lethal weapons.

Today, biological weapons are modern and highly dangerous instruments of war due to their low production costs as well as their effectiveness, particularly in densely-inhabited regions and states.

States are now obliged to make use of new techniques and Biosecurity policies as countermeasures to confront the possibility of the use of biological weapons and bio-hybrid threats, especially by terrorists and other 'lonely wolves', while at the same time increasing information-sharing and the synchronization of moves and decisions to ensure global health, peace and security.

Global Biosecurity cooperation among states for a mutual confrontation of biological threats and Hybrid threats in cooperation with international organizations and specialized Non-Governmental Organizations (NGOs) as well as International Civil Society Organizations (ICSOs) can provide the basis for effective response and prevention of non-legal use of biological weapons by states and terrorist groups whose ultimate goal is deadly attacks and the spread of fear at the international level.

## Ethics

This article is original and contains unpublished material. The author has read and approved the manuscript and no ethical issues are involved.

## References

- Boniface, P. (2001). *Geographic Atlas of International Relations*. (Translated in the Greek Language as *Atlas of International Relations*, Hellenic Letters, Athens), Hellenic Letters Publications, Athens.
- Boniface, P. (2004). *Wars of Tomorrow*. (Translated in the Greek Language as *Tomorrow's Wars*, Papazisis Publications, Athens), Papazisis Publications, Athens.
- CDCP. (2016) Centers for Disease Control and Prevention. «What is Bioterrorism», *Bioterrorism Overview*.  
<http://emergency.cdc.gov/bioterrorism/overview.asp>
- CNNG. (2015). «Alert for attacks with weapons of mass destruction by ISIS in the EU».  
[http://www.cnn.gr/news/kosmos/story/13462/synagemos-gia-epithesi-me-opla-mazikis-katastrofis-apoton-isis-stin-e-e?utm\\_source=Facebook&utm\\_medium=Organic&utm\\_content=Kosmos&utm\\_campaign=News](http://www.cnn.gr/news/kosmos/story/13462/synagemos-gia-epithesi-me-opla-mazikis-katastrofis-apoton-isis-stin-e-e?utm_source=Facebook&utm_medium=Organic&utm_content=Kosmos&utm_campaign=News)

- Friedman, T. (2001). Lexus and the Olive Tree-Understanding Globalization», (Translated in the Greek Language as Lexus and the Olive-What is Globalization, Oceanida publications, Athens), Okeanida Publications, Athens.
- Frischknecht, F. (2003). The history of biological warfare: Human experimentation, modern nightmares and lone madmen in the twentieth century. *EMBO reports* 4(S1), S47-S52.  
<https://www.embopress.org/doi/full/10.1038/sj.embor.embor849>
- Gilpin, R. (2009). *Global Political Economy*, Princeton University Press, (translated in Greek as: *World Political Economy - The International Economic Order*, Quality publications, Athens) publications Poiotita, Athens.
- Held, D., & McGrew, A. (2004). *Globalization/Anti-Globalization*, (Translated in the Greek Language as: *Globalization/Anti Globalization*, Polytron Publications, Athens), Polytron Publications, Athens).
- Huntington, P. S. (2001). *The Clash of Civilizations and the Remaking of World Order*, (Translated in the Greek Language as: *H Clash of Civilizations and the Reconstruction of World Order*, Terzopoulos Publications, Athens), Terzopoulos Publications, Athens.
- McLean, I., & McMillan, A. (2009). *The concise Oxford dictionary of politics*. OUP Oxford.
- Nye, S. J. (2003). *The Paradox of American Power: Why the World's Only Superpower Can't Go It Alone*, (Translated in the Greek Language as: *To Paradox of American Power. Why the only world superpower can not go it alone*, Papazisis publications, Athens), Papazisis Publications, Athens.
- Pruszewicz, M. (2015). How deadly was the poison gas of WW1 BBC Magazine, listed in:  
<http://www.bbc.com/news/magazine><http://www.bbc.com/news/magazine-3104247231042472>
- Riedel, S. (2004). Biological warfare and bioterrorism: A historical review. In *Baylor University Medical Center Proceedings* (Vol. 17, No. 4, pp. 400-406). Taylor and Francis, listed in:  
<https://www.tandfonline.com/doi/pdf/10.1080/08998280.2004.11928002>
- United Nations. (2010). «The Biotechnology Initiative», and «Global Issues-The Life Sciences Revolution and the Implications for Development» are listed in.  
<http://www.un.org/en/globalissues/biotechnology/index.shtml>
- White House (2009). Barack Obama Administration: «National Security Council-National Strategy for Countering Biological». <https://obamawhitehouse.archives.gov/the-press-office/president-obama-releases-national-strategy-countering-biological-threats>
- The Huffington Post. (2015). "Terrorist attack with chemical weapons feared in France" (Terrorist attack with chemical weapons is feared in France). [http://www.huffingtonpost.gr/2015/11/19/tromokrati-a-gallia-xhmika\\_n\\_8597900.html](http://www.huffingtonpost.gr/2015/11/19/tromokrati-a-gallia-xhmika_n_8597900.html)
- The Guardian, (2015). «Top-secret military warning on Ebola biological weapon terror threat», UK news. listed in.  
<http://www.theguardian.com/uk-news/2015/feb/21/top-secret-ebola-biological-weapon-terror-warning-al-qaida-isis>
- The Independent, (2015), «Paris attacks: Isis “chemical weapons” warning issued by French PM Manuel Valls»,| Europe, listed in:  
<http://www.independent.co.uk/news/world/europe/paris-attacks-french-pm-manuel-valls-issues-isis-chemical-weapons-warning-a6740156.html>