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**A STRATEGIC  
REVIEW OF THE  
BIOLOGICAL  
THREAT  
IN THE LIGHT OF  
POST-COVID-19  
UNCERTAINTIES**

By  
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# A strategic review of the biological threat in the light of post-Covid-19 uncertainties

By Rachid El Houdaïgui and Abdelhamid El Ouazzan<sup>1</sup>

**«Science without conscience is but the ruin of the soul»**

– François Rabelais, French humanist author, (1483-1553).

## Summary

**Rumours about the Covid-19 pandemic, which spread from Central China in mid-November 2019, are fuelling several conspiracy theories. These include, for example, the assumption of a biological attack against the backdrop of a trade war or a leak of the SARS Co-V2 pathogen from a Chinese biological programme. On the sidelines of this speculative spiral, the debate on the use of biological weapons is being reactivated.**

In fact, several pathogens of natural origin, genetically modified, or now even engineered in laboratories, can be used lethally as biological weapons against humans, animals or vegetation, as well as for the decomposition of certain materials. These germs can be viruses, bacteria or toxins. Scientific progress, in particular in genetic engineering, nanotechnology and bioinformatics, would make it possible to increase the lethality of these biological weapons and, consequently, their military utility as strategic means of confrontation or terrorism.

As such, the military utility of biological weapons can be strategic in scope, involving political decision-making, but also tactical in terms of the conduct of operations on the battlefield. Moreover, biological weapons can be adapted to different contexts. They can be used as a deterrent or a force multiplier in open confrontation, as well as be insidiously employed in a hybrid conflict, a bio-terrorist attack or a bio-criminal act.

In addition to their highly dreaded epidemiological lethality, biological weapons can cause serious political and socio-economic consequences. On another equally harmful note, the “Spanish flu”, which had struck America, Europe and Asia between 1919 and 1920, caused between 30 and 50 million deaths. Currently, the impact of one month of lockdown due to the Covid-19 pandemic is estimated at around €60 billion for France, or a loss of 2.6 points of its annual GDP, according to a memo from the French Economic Observatory (OFCE), published on 30 March 2020.

Furthermore, and given the increasingly preponderant weight of public opinion, the agricultural and food sectors constitute such a vulnerable centre of gravity that, if these

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two sectors are disrupted by a biological attack, it will lead the target state to reconsider its resilience and revise its war objectives (its final desired end-state). This vulnerability concerns all countries, both rich, where agriculture contributes up to 15% of GDP, and poor (up to 70% of GDP). In this respect, the dioxin crisis in Belgium in 1999 is instructive. In fact, accidental dioxin contamination of animal feeding stuffs led to the closure of 4 000 farms and a six-month ban on the export of food products, causing the Belgian agri-business sector to lose billions of euros and contributing concomitantly to the government's electoral defeat.

Pathogenic germs have always been used in armed conflicts. The perfections achieved through advances in genetic engineering will lead to major upheavals in the new art of warfare. It is interesting to demonstrate the driving force behind these changes, in order to better measure the importance of these upheavals and, perhaps, to try to predict the possible outcomes of the ongoing evolution.

## **I. What can be said about the specifics of biological weapons?**

Described as the « poor man's atomic bomb » because of their apocalyptic damage, biologic weapons, on the other hand, require little infrastructure and equipment for their production, storage and dissemination. The dual use of production equipment, combined with the difficulty of tracing the biological attack, increases this cost/virulence advantage. However, its military usefulness depends on certain characteristics related particularly to its stability during production, storage and dissemination. It also depends on its resistance to environmental hazards (temperature, antibodies, etc.) and its speed of contagiousness and high morbidity rate.

In fact, from antiquity to the 1970s, only pathogens such as plague, smallpox, anthrax or certain toxins were used in their natural state as weapons of “mass destruction” or, more precisely, “mass murder”. The industrialization of this weapon, known as first generation, has developed since the Pasteurian revolution, which permitted the isolation of genes and their artificial culture.

The second-generation biological weapon has developed thanks to technological advances that allow the manipulation of genomes, making them more stable, resistant and virulent. The production of a hybrid virus, derived from the smallpox and Ebola viruses, inheriting the resistance of one and the virulence of the other, is one of the many examples.

Third generation biological weapons will be manufactured from new pathogens created by synthesis (in vitro), and according to DNA sequences developed by computer simulation (in silico). The first successful experiment with these technological advances dates back to 2002.

The post-third generation trend would be not only to produce new pathogens that are more virulent and resistant, but to make them more “intelligent” in terms of ethnic targeting and adaptation to countermeasures. There is clearly no human group that is sufficiently homogeneous to be specifically susceptible to a pathogen. However, many

genes have different distributions among various subgroups, and it is possible to imagine a misguided attempt to develop any organism with a preference for certain population groups based on their intrinsic gene<sup>2</sup> distribution.

This suggests that the biological weapon is not, as has often been incorrectly proclaimed, a less important weapon of mass destruction. Its destructive potential may prove to be out of all proportion to what can be imagined. In addition to this potential for destruction, consideration should be given to its political and socio-economic impact on a local, regional or global scale.

Because of its characteristics in terms of its cost/virulence ratio, surprise, ubiquity and difficult, if not impossible, traceability, the biological weapon is producing a revolution in the art of warfare. Indeed, response times are relatively long because of the latency time between the act of disseminating the pathogen and the appearance of its epidemic effects. Similarly, there is no such thing as absolute protection. In this regard, measures such as epidemiological surveillance and early warning, vaccination, special clothing, lockdown, are too expensive and provide only relative protection.

Thus, the wall of soldiers and weapons systems lined up to defend the territory is powerless to protect the country from an epidemic and its indirect political and socio-economic consequences. Consequently, biological weapons imply a revolution in the conception of the security and defence of States.

Theoretically, the best defence is to forbid the adverse party from developing biological weapons; and if he succeeds in developing them, to prevent him from using them. Three strategic options can therefore be considered:

- Preventive destruction of weapons, means of delivery and facilities: this option appears to be technically and legally problematic. The opacity of biological programmes, the dispersal of sites, the camouflage of facilities, generally of a dual nature, and the military means of protecting them, make it virtually impossible to eradicate the potential threat completely and rapidly. Similarly, from the point of view of international law, preventive destruction will be considered as aggression, as long as the threat is not imminent and in the absence of the material element of « armed attack » under Article 51 of the UN Charter.
- Pre-emptive destruction and interception: This option is technically impossible because of the difficulty in detecting and proving the imminence of the attack if it is carried out by a covert operation. The ideal early detection is technically difficult and financially burdensome because the spectrum of pathogens is so wide that the creation of new germs is now thanks to the 2nd and 3rd generation weapons.
- Deterrence or strategic paralysis: This solution is very subtle and requires special conditions of sufficiency and credibility. In contrast to defensive methods whose outcome is uncertain (prevention, pre-emption and interception), deterrence strategy consists in bending the adversary's will, without going through the test of force, by getting him to renounce the use of biological weapons.

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2. Richard Novick and Seth Shulman, «New Forms of Biological Warfare? » in Susan Wright, «Preventing a Biological Arms Race », Éd. MIT Press, Massachusetts, 1990, pp. 103-119.

## II. What anti-biological deterrence?

Any strategic decision is based on a rational calculation of the ratio (Means x Risks / stakes). Deterrence consists in paralyzing the opponent to prevent him from making the decision, by amplifying the uncertainty in his evaluation of this ratio. In order to do so, it is necessary to succeed in making him understand that the risks incurred are highly disproportionate, compared to his expectations of gains included in the stakes. A « deterrent threshold » can be determined here, corresponding to the risks (damage and losses) that would be unbearable to him, regardless of the advantage to be gained from confrontation. Otherwise, to irrationally trigger an action that would lead to a fatal issue is not the right strategy. This would simply amount to a passionate jump into the unknown. This notion of a « deterrent threshold » is interesting insofar as it makes the deterrence strategy operational, both in situations of symmetry (proliferating state vs. proliferating state), dissymmetry (non-proliferating state vs. proliferating state) and asymmetry (non-state actor vs. state).

For each of the belligerents, the strategic calculation operates according to the balance of power, as well as the perception of the rationality and determination of the adversary. In the context of nuclear conflict, André Beaufre places the sufficiency and credibility of the belligerents at the heart of nuclear deterrence<sup>3</sup>. In this equation, sufficiency refers to the consistency of the means available. On this subject, it is understood that, in addition to conventional or non-conventional military means, the inventory of means must be extended to other levers allowing indirect (diplomatic, economic...) strategic action. In the strategic field, it is necessary to plan in a holistic manner (comprehensive approach). In short, the idea is to be able to intimidate the opponent to the point of getting him to renounce engaging in hostilities. To do this, it is necessary to have an efficient intelligence service and a health system (monitoring, reaction and traceability), and to be determined to preventively or pre-emptively launch retaliatory actions by a sufficiently inhibitive force of destruction, through its power of penetration, precision and destruction.

The notion of destruction that is psychologically sufficiently inhibitive remains problematic in terms of its quantification and control of possible escalation to extreme situations in case of failure. Thus, reprisals would be inhibitive either in “counter-city” mode, aiming at the destruction of the population, following the model of Hiroshima/Nagasaki or at ruining economic power; or in “counter-force” mode seeking the disarmament of the adversary. « Regime change » threats may ultimately prove to be a great deterrent. Also, « counter-force » retaliation should prevent any counter-battery attempts by the adversary. Otherwise, retaliation and counter-retaliation lead to mutual destruction, by escalating to extreme situations, which would affect the most sensitive belligerent.

However, below the deterrent threshold, belligerents have a margin of freedom of action known as the « margin of non-deterrence ». The existence of this speculative state of affairs can lead to low-intensity or indirect confrontations (hybrid warfare or 4th generation warfare). Deterrence at this level should therefore be extended in a graduated manner (graduated responses), while preparing for an escalation to extreme situations in case of failure of the deterrent logic.

For the purposes of this additional deterrent, two processes are available: material and

3. André Beaufre, « Introduction to strategy », Éd. Fayard | Pluriel, Paris, 1963, p. 111.

psychological. The first consists in confronting the adversary with a defence and security system capable of thwarting the actions he might take within his probable margin of freedom of action, in addition to a resilience system that enables damage to be contained promptly and a quick return to normal. The second process is to establish and maintain a sufficient and credible threat of extreme escalation, even if some freedom of action, however subtle, is exploited.

The history of the Cold War is full of examples of the importance of this complementary deterrent, especially when threats of retaliation cancel each other out by equal power relations. Nevertheless, escalation could occur spontaneously and turn a minor incident into a general conflict. In this regard, André Beaufre's warning is instructive: « Accepting limited conflict, is it not already an invitation to do so, thus reducing the deterrent, and if a limited conflict is triggered, will it not increase the risk of extreme escalation? ».

Insidiously, complementary deterrence somehow demystifies biological weapons. Without replacing or silencing their predecessors, biological weapons complement the range of weapons, whether they are described as white, non-lethal, light, small or large calibre, atomic, radiological, chemical, etc. we can thus agree with Von Clausewitz that war changes its rhetoric (belligerents, equipment, ...), but not its logic (in other words, a continuation of politics by other means).

On the other hand, the deterrent effect of biological weapons may be undermined by the ineffectiveness of the related legal regime, which lacks a monitoring, verification, implementation and enforcement mechanism.

### **III. What is the current status of the ban on biological weapons?**

Prohibition of the use of toxic substances as weapons of war was established before World War I, through the Geneva Protocol on the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, signed in 1925 and entered into force in 1928. It should be emphasized that the Geneva Protocol prohibits the use of biological weapons, but not their production, stockpiling or deployment.

Indeed, many States have issued the right to respond by similar means in the event of an attack using biological weapons. Overall, the Geneva Protocol was respected for most of World War II, with the exception of Japan, which openly developed, tested and used biological weapons offensively against its adversaries. During and after World War II, other States conducted research on biological weapons. The most important programmes were those of the United States and the Soviet Union and concerned first-generation weapons, including anthrax, smallpox, plague and tularaemia.

The Geneva Protocol was supplemented in 1972 by the Biological and Toxin Weapons Convention (BTWC). The BTWC, which entered into force in 1975, prohibits the development, production, stockpiling and acquisition of biological or toxin weapons, the conversion of such weapons and their means of delivery and requires their destruction<sup>4</sup>.

4. Today, only ten States have remained outside the BTWC, including Guinea, Israel, Mauritania, Mozambique and Namibia.

The Convention formulates the principle of a « general purpose criterion », according to which all associated activities are prohibited unless their peaceful purpose, as permitted by the Convention, can be justified, in particular with regard to the types and quantities of biological agents used for prophylactic, protective or other peaceful purposes (Article 1).

States have always known that these non-conventional weapons constitute an existential threat and require wide-ranging and increasingly urgent international cooperation in the light of technological progress in life (or rather death!) sciences. This urgency is the result of the convergence of several factors, one of which is a loophole in the BTWC, which does not provide for monitoring, verification, implementation, and enforcement mechanisms, unlike other regimes, such as nuclear weapons and small arms and light arms.

Another factor is that many states have not yet adopted legislation or other instruments to ensure that they fulfil their obligations with regard to biological and toxin weapons, as stipulated in Article 5. There is also concern that efforts to develop or maintain biological weapons capabilities and expertise are being concealed behind abusive pretence of biodefense programmes or civilian public health programmes as a cover.

Finally, the threat of terrorist acts using biological weapons is a growing concern in the light of the psychosis accompanying the Covid-19 pandemic. Fears are not only limited to the gruesome toll of hundreds of thousands of deaths and millions of infected people, but also to the economic disasters that could befall states, both rich and poor, as evidenced by the fact that several indices on the stock markets, in the financial markets, the energy and services sectors and, above all, the food industry<sup>5</sup> etc., have gone into the red.

Since the entry into force of the BTWC in 1975, it had taken sixteen years for the international community to mobilize to find ways to strengthen compliance with the Convention. In 1991, the States Parties established an Ad Hoc Committee of Experts on Verification (VEREX) of compliance with the provisions of the Convention. This committee submitted its first report, with recommendations, in 1994. The Conference of the States Parties agreed to draft a legally binding instrument (Verification Protocol). Discussions continued until 2001 and came to a halt following the withdrawal of the United States<sup>6</sup>. It subsequently appeared that the draft Verification Protocol could not make further progress without the support of the United States. Since then, annual meetings of experts have been held, with conferences of political officials. The eighth Conference was held in 2019.

In addition, the UN Security Council, through Resolution 1540, adopted in 2004, has contributed to the strengthening of the legal regime on biological weapons. Binding on all United Nations (UN) Member States, the resolution reaffirms that States must fulfil their arms control and disarmament obligations and prevent the proliferation, in all aspects, of all weapons of mass destruction. Thus, States are urged under Article 1 to « adopt and enforce, in accordance with their domestic procedures, appropriate effective legislation to prohibit any non-State actor to manufacture, acquire, possess, develop, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery » and under Article 3 to « take and enforce effective measures to establish domestic controls » to prevent the proliferation of such weapons. This resolution reinforces in practice Article

5. Cf. Frédéric Suffert, « Voluntary use of phyto-pathogens against crops », *Revue PHYTOMA*, N° 563, 2003.

6. Cédric Poitevin, « Monitoring the prohibition of biological weapons: an assessment of the current situation », GRIP, 2006, p.1, available on line: [http://archive.grip.org/fr/siteweb/images/NOTES\\_ANALYSE/2006/NA\\_2006-01-17\\_FR\\_C-POITEVIN.pdf](http://archive.grip.org/fr/siteweb/images/NOTES_ANALYSE/2006/NA_2006-01-17_FR_C-POITEVIN.pdf)

4 of the BTWC, which commits States Parties to prohibit the acquisition of biological weapons by any person under their jurisdiction or control.

## IV. Back to the future of the biological risk?

As pointed out earlier, biological warfare had existed in primitive forms for several centuries in the form of contamination by pathogens in their natural form. The Pasteurian revolution led to the industrialization of biological weapons, which, unlike chemical weapons, remained marginally used in World War I. During the Second World War, several states developed biological programmes, despite their epidemic power, such as Germany, France, the United Kingdom, the United States, the Soviet Union and Japan. The latter was the only country to have used biological weapons offensively, particularly against China, but with little success.

During the Cold War, the two superpowers established major programmes for research and development of offensive biological weapons. When the United States strengthened its nuclear deterrent, the Nixon Administration decided to unilaterally abandon any offensive biological programme in view of its limited military utility. Susan Wright sums up the situation well by noting that « The use of biological weapons would be so risky for any party involved that the United States did not feel threatened by the prospect of abandoning it altogether »<sup>7</sup>. This decision facilitated the signing of the BTWC in 1972.

In this euphoric context, several countries have followed the United States in abandoning biological programmes prohibited by the BTWC, while others have continued or initiated research and development in this field. The most emblematic case is the Soviet Union which, despite its status as a depositary state of the BTWC, has intensified its biological programme called BIOPREPARAT<sup>8</sup>.

Since 1975, several countries have been suspected or accused of having programmes that are prohibited under the BTWC, including China, North Korea, South Korea, South Africa, Egypt, Sudan, Syria, Iraq, Iran and Israel, among others. Behind this proliferation, there is a common representation of a threat to the very existence of the State, or, for some, as a means of internal intimidation<sup>9</sup>. It is this same representation of existential insecurity that led the Reagan Administration to reconsider, as early as the mid-1980s, the Nixonian renunciation decision. As such, Under-Secretary of Defence for Policy, Douglas Feith, told Congress in August 1986, that « The judgment that prevailed years ago that biological warfare is not a militarily significant weapon is now completely unsustainable. Biological warfare can be designed to be effective in the full range of combat, including special operations and engagements at the tactical level. »<sup>10</sup>

After the end of the Cold War, the biological threat began to increase as a terrorist option

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7. Richard Novick and Seth Shulman, «New Forms of Biological Warfare? », op. cit. 104.

8. Pierre Lellouche, Guy-Michel Chauveau and Aloyse Warhouver, « Proliferation of weapons of mass destruction and their means of delivery, Information Report n° 2788, The Incredible Soviet Biological Programme », at French National Assembly, National Defense and Armed Forces Committee, 7 December 2000.

9. Chandré GOULD, « Chemical and biological weapons: Lessons from South Africa », Foreign Policy, Biological Weapons Dossier: from the 20th to the 21st century, 2005.

10. Richard Novick and Seth Shulman, «New Forms of Biological Warfare? », p. 105

available to terrorist groups or nihilist sects<sup>11</sup>. As an illustration, two fairly well-documented cases can be cited. The first is the Japanese sect Aum Shinrikyō, known for its attack in the Tokyo subway in 1995, killing 12 people and injuring several thousand, not counting its repeated anthrax attacks between 1990 and 1995. The second case concerns the 2001 anthrax attacks in the United States, in which 5 people were killed and 22 sick, attributed to Bruce Ivins, an American scientist working in military biological research.

In fact, since these two attacks, the fear of a large-scale bio-terrorist action has continued to grow, all the more so since the Covid-19 pandemic could still inflame people's minds about the lethal potential of first-generation weapons. Bio-terrorism is therefore a real threat, since it is recognized that terrorist groups with the necessary motivation, organization and technical capabilities, can use biological agents. Easy access to knowledge, to data on the Internet, to secret and anonymous communication channels, such as the dark net, are all organizational means for any asymmetrical action.

## Conclusion

After the health crisis, global issues will regain their autonomy on the basis of one of the already established but reinforced strategic trends, namely Transformation in Military Affairs (TAM).

The article provides an overview of many issues related to the biological threat, showing both the significant challenges and the potential for progress in biological weapons control. It is neither a zero-sum game nor a matter of winners and losers; it is an area that calls for a spectacular and rapid improvement in its legal framework. While there is willingness on the part of most states to strengthen norms against the use of biological weapons and to consolidate global governance in this regard, their engagement in the post-Covid-19 context will be a key factor in determining whether the world is returning to stronger risk mitigation in relation to the threat of biological weapons. The international community is looking for new ideas that could change the current trajectory and reinvigorate biological arms control and defence against bioterrorism. In this regard, research centres and think tanks, particularly in Africa, should take the lead in developing these ideas and become actively involved in this field.

The use of biological weapons in hybrid warfare is potentially possible, if global governance is not urgently strengthened and expanded. Reducing this devastating risk is achievable, and it is now time to act.

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11. W. Seth Carus, « A short history of biological warfare: from pre-history to the 21st Century », NDU Press, Washington DC, 2017.

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