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BIOTERRORISM AS A CURRENT SECURITY THREAT

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Abstract

At the end of the 20th and early 21st century, there is noticeable increase in the number of terrorist attacks and the threat of biological weapons. The potential destructiveness of bioterrorism is such that it can now be considered as a strategic threat. On the other hand, the characteristics of biological weapons are an important factor in the possible use of these weapons, and their classification. In addition, the technology of converting biological material into weapons is available to the terrorist and criminal groups today. The authors question the absence of a clearly defined conceptual apparatus and a solid theoretical framework of biological weapons and bioterrorism. The paper also discusses whether the existing classification of biological weapons and bioterrorism meets current and possible scenarios of bioterrorist attacks. We believe that the answers to these and other questions using typology and classification criteria can contribute to the development of forecasting scenarios, particularly bearing in mind: high mortality rates; the fact that a very small amount of pathogens can achieve strategic effects of destruction; easy and quick activation; equipment required is inexpensive and easy to procure; active live cultures of microbes, which are used already in the natural environment, or can be ordered from a biological storage.

Key words: bioterrorism and biological weapons, security, classification

Introduction

Contemporary terrorist threats acquire completely new dimensions. This primarily refers to the weapons of mass destruction, since the possibility of their application has

rapidly increased in the most recent period due to the development of new technologies and scientific knowledge. Many terrorist organisations proclaim in their programs possible use of the weapons of mass destruction of incalculable consequences. On top of that, this most probably means the use of biological, radiological and chemical weapons, while the use of nuclear weapons is not excluded either. Unfortunately, history records numerous examples when chemical and biological weapons were used. On the other hand, there are few data from national intelligence agencies, particularly when it concerns intentions, motives and capabilities of terrorists for a serious biological attack or the type of biological weapons that would be used.

The characteristics of biological weapons are rather an important factor of their possible use, but also of their classification. There is also a question related to this: do the existing classifications of biological weapons and bioterrorism fit the actual and possible scenarios of bioterrorist attacks and do they support the actual and possible ranges of the biological weapons development? There is also a problem of inexistence of clearly defined conceptual apparatus and firm theoretical framework of biological weapons and bioterrorism.

Terrorism as a contemporary threat

Unlike more frequent and more predictable incidents like criminal offenses or natural hazards, terrorist acts are difficult to anticipate. For criminal incident estimates we can use either criminal statistics and/or asset target value estimates. On the other hand, factors impacting the probability of a terrorist event are not constant in time, especially because the frugal world or regional politics are an inspiration for such incidents. Although some rough approximations can be made for specific regions, states, and even cities or their neighbourhoods, it is almost impossible to specify the likelihood that a terrorist attack will occur with any definite statistical confidence at a particular time in the particular location. Historical data on previous occurrences are not the most reliable source in estimating terrorism risk, as the conditions driving terrorists may change over relatively short timescales. Even if the conditions remain stable, there is often very limited amount of historical data from which the probability or likelihood of a terrorist attack can be estimated. In statistics, this condition is called small sample space, and in such instances giving phony and misleading quantitative results should be avoided (Young: 2010).

Given their relatively rare occurrence, there are no useful sources for estimating the probability or likelihood of the facility in question to be a potential target to a terrorist.

Therefore, the key question is not how likely a terrorist event is to happen, but rather whether a specific facility is likely to be of interest to a terrorist organization or an individual. Again, due to the low number of these events, quantitative methods can be misleading and the scenario planning remains the best bet.

Security managers and decision makers regard terrorism as a high-risk, low-probability concern that needs to be addressed on an irregular basis. This means that once the contingency plans, emergency procedures and business continuity plans are established, they can turn their attention back to the 'everyday crimes' and other day-to-day issues that threaten the organization's assets. Certainly, like other 'normal criminals' the terrorists will select the most vulnerable target and the one that will generate the highest 'yield' to their objective. What we can sometimes predict are methods and tactics of the attacker as most organized groups tend to maintain the same modus operandi throughout their existence. Particularly because attacks can be implemented in various ways and for different reasons, it will significantly affect the likelihood and the vulnerability components of risk. In devising scenarios, we must also think about what is and what is not technically possible, but we must always bear in mind that terrorists can occasionally find their way around technical difficulties or to get lucky only once.

Even though threat assessments are critical for security decision makers, not even the best assessment can anticipate every possible scenario, as terrorists always *adapt to the countermeasures* (Norman, 2010). What we need to do is to try to put ourselves in the place of the terrorist and devise possible methods and targets, which would then serve us to prevent their occurrence or to mitigate their effects. It is more difficult to do with terrorists, than with, say, 'normal criminals' as we must place their way of thinking into ours, regardless of how far different from ours it may be.

The goals and objectives of adversaries, i.e. terrorists, should continually be studied and their *motivation* and intent must be evaluated. Motivation of terrorists is political, or more broadly speaking – ideological. Therefore, their targets often symbolize the object of their hatred. However, targets may not be of the same value to the owner and to the adversary. Usually, when evaluating *target values* the following factors should be taken into account: casualty and injury rates; asset potential for loss, damage or destruction; damage to the political landscape; disruption to operations; disruption to the economy; media attention; impact on the organization's reputation; impact to employees' morale; fear.

Another variable that can and should be assessed is the capability of the terrorist group in question. *Terrorist capabilities* may include highly trained and skilled military units,

armed with explosives, even with unsophisticated nuclear weapons – 'dirty bombs'. The capability of the adversary will greatly influence the threat dimension of risk.

Conceptual determination and characteristics of bioterrorism and biological weapons

Various authors have defined biological terrorism variously. Bioterrorism is the use of biological and chemical agents in air, water or food in order to cause death of a large number of people or social disturbance. The diseases which are most frequently used today include anthrax, botulism, plague and other diseases which can cause a fatal outcome. Terrorist actions can be targeted in such a way as to cause mass panic, i.e. to have psychological effect, so that it can be said that bioterrorism can be classified as psychological warfare as well. Motivation is usually such as to harm the perceived enemy, get publicity and prove power.

Biological terrorism means the use and spreading of various types of biological weapons, as well as biological agents and toxins within population centres in order to destroy morale of people and cause numerous casualties (Gacinovic 2005, p. 134). Bioterrorism is a matter of special concern because of the combination of high mortality rate, relatively simple manner of production and possibility of covert use. Its potential destruction is such that nowadays it is considered a strategic threat, since it can cause suffering of wide scope. Bioterrorism is perfidious, which means there exists a silent period (incubation) of several days before any signs of disease appear, so bioterrorist can escape the crime scene in time, unnoticed and without any doubt that they committed a terrorist act. According to the knowledge of the American security services, there is an interest among 'criminals', even among terrorists, regarding biological and chemical weapons, the number of possible perpetrators is on the rise and many such groups have international networks and do not depend either financially or technically on sponsors from one country alone. Terrorists more frequently use conventional weapons (explosives and fire arms) than biological or chemical weapons. In the last decade of the 20th century there was a clear increase of the number of terrorist attacks and threats of biological weapons. The technology to transform biological and chemical material into weapon is claimed to have been conquered today and available to terrorist and criminal groups (*ibid.* p. 35).

In literature, there are also other definitions of biological terrorism. Biological terrorism means: the use of biological agents in terrorist actions in order to cause infectious diseases in innocent civilians or military formations, animals and plants, and

which are spread in the form of either epidemics or pandemics; the use of biological agents as the weapons of mass destruction and disabling adversary's armed forces and resistance in both local and regional wars; military, police and scientific research of biological weapons and abuse of scientific knowledge in the field of genetic engineering in order to produce 'super' germs – killers of innocent people; all forms of scientific and quasi-scientific experiments with germs on animals and people, since such experiments have put mankind in jeopardy (the example of experimenting with HIV, Ebola, etc.); production and smuggling of biological weapons and already mentioned 'super' germs, illegal sale of special samples of dangerous strains of bacteria, viruses, rickettsia and their toxins and similar (Jovic and Savic 2004, p. 34).

The basic characteristics of biological weapons include: simple and inexpensive production, covert use, specific impact on people, causing of large-scale sickness or death, disturbance in the work of health and other services, occurrence of problems related to quick detection and identification of the used agents, establishing of adequate measures of neutralizing biological weapons and adequate treatment of the sick people and prophylaxis of healthy people, impossibility of full control as well as the lack of adequate pieces of information on experiences in the use of biological weapons (Gacinovic *ibid.*, p. 134).

The mentioned characteristics of biological weapons are an important factor of their classification, since classification criteria are generated from these attributes.

- In order to suit their purpose, biological weapons should have the following characteristics:
- Be capable of wide-spread and large-scale destruction and incapacitation of personnel and flora at the territory of one country or on a global scale (epidemics or pandemics of infectious diseases). Each man, animal or plant that are infected or get ill become a source of infection so the disease is spread quickly even to those who are not within the scope of biological attack in the war, in other words at distances far from the point of impact;
- Duration of effects of spreading of epidemics and maintenance of endemic foci of infection. Some agents of disease are capable of keeping the capability to cause disease for a long period of time, from several days to several months, depending on the environment they are in and their characteristics;

- Existence of incubation period, which makes it difficult to timely diagnose the disease and detect the biological attack, but also to timely undertake the counter measures. Incubation enables the aggressor to choose the time and place of impact, as well as the possibility to remove traces of crime;
- Suitability for covert terrorist use, primarily for contamination of water and food, as well as the flora and fauna;
- They leave delayed consequences in the form of either germ-carrying or endemic foci of infection;
- Wartime conditions are favourable for creating preconditions for the use of biological weapons and their maximum efficiency of fast spreading the infectious diseases in the form of epidemics and even pandemics. (Jovic 1999, p. 368)

Generally, *biological weapons* include all pathogenic microorganisms or their toxins which are used to deliberately cause illness and death in people, animals and plants, even the environment as a whole. In a wider sense, in addition to *pathogenic microorganisms* and *toxins* (toxic products of some microorganisms, plants and animals), biological weapons include also *insects* and some species of *animals* and *birds* – as disease carriers. According to international conventions, these are "microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes, as well as weapons, equipment and other means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict."

Biological weapons can be classified according to various criteria, taking into account their various attributes. This is why several classifications of biological weapons exist, depending on the *selected criteria* and *members of classification*, *based on the requirements of classification*, which are mostly set for "pragmatic reasons of certain states".

Problems of biological weapons classification

The problem of definition – classification of bioterrorism and biological weapons is the consequence of unresolved taxonomic problem in the field of social sciences, as well as inconsistent application of the existing knowledge in the field of methodology and subject theory in the considered field. This is why conceptual determinations and classifications

which can be found in theory of the considered field do not fully meet the scientific element requirements.

The research in this field so far contain the following classifications of bioterrorism and biological weapons:

- *Genocidal* form is the use of biological agents against people.
- *Agroterrorism* is the use of biological agents on agriculture and food of both animal and plant origin. The use of biological agents against domestic animals is zoocidal form, and against plants is phytocidal form of biological terrorism. The danger from this form of terrorism is rather huge and certain, since the degree of protection of agricultural resources is much smaller in comparison with the protection of population.
- *Ecocidal* form is the third form of bioterrorism, where there is environmental pollution as a result of the use of biological agents, either by direct use against the environment or as a consequence of the use of biological agents in agro-terrorist attack. This form is often considered a collateral damage of bioterrorism. (Jovic and Savic *ibid.,* p. 89)

The most frequent agents which could be used in bioterrorist attacks are: bacteria, viruses, rickettsia, protozoa and fungi. In addition to pathogenic microorganisms, *toxins*, some *insects* and some *animals* are classified as biological weapons.

The main remark to one of the most common classifications of the agents that could be used in bioterrorist attack goes to the classification to bacteria, viruses, rickettsia, protozoa and fungi. This classification does not include toxins as a special group, although some of the strongest toxins that may be used as biological weapons are bacterial products.

The most probable bacteria toxins that could be used as biological weapons are the toxins of botulism, tetanus and **Staphylococcal enterotoxin**. The toxins of these three species of bacteria are the most lethal ones and minimum quantities are required to kill a vast number of people. Although the most toxic toxins belong to bacteria, a large group of toxins belongs to some species of sea organisms, algae, plants, fungi, insects, snakes and amphibians. This tells us that toxins represent a special entity among agents that could be used as biological weapons together with bacteria, viruses, rickettsia, protozoa and fungi.

The main classification – a threefold classification of biological weapons with some small amendments can be found at several authors and it is based on military-epidemiological criteria of biological weapons classification. There is a formal threefold

(military) classification of biological weapons to generic (according to the type), operative-tactical (according to the purpose and target) and according to the efficiency of the weapons.

Generic classification according to the type: microorganisms pathogenic for people, animals or plants, from the group of viruses, rickettsia, bacteria, protozoa and fungi; toxins, chemical toxins of biological origin: botulinum toxins, Staphylococcal enterotoxin B and mycotoxins; some insects, as biological vectors causing infectious diseases (mosquitos, lice, ticks, flees) and as pests for people, animals and plants; some animals and birds, as biological vectors causing infectious diseases in people and pests for people, animals and plants.

Operative-tactical classification, according to the purpose and target: tactical–sabotaging means for covert use in sabotaging-terrorist actions; operative-tactical for covert or open use; strategic biological weapons, for public use as a rule.

According to the efficiency: lethal biological agents, with disease lethality ranging from 10% to 100%; non-lethal biological agents, with disease lethality up to 10%; biological incapacitants which are conditionally incapacitating means in relation to personnel and flora (insects, birds, some animals).

According to their characteristics, biological agents are divided into three categories:

- *Category A* – this category includes the agents with the following characteristics: they are easy and efficient to spread, very infectious, lethality is very high, they can cause general panic with all accompanying manifestations and consequences, and they require special preparations and action of the entire health service. This category includes causative agents of small pox, botulism, plague, tularaemia, viral haemorrhagic fever.
- *Category B* – includes the agents which are spread relatively easily, they result in moderate illness rates and low death rates. Their use causes lethality which ranges from 2 to 5% and based on that they are classified into the group of incapacitating agents.

- *Category C* – includes newly created and some of formerly known agents which can be used as biological weapon in perspective. Their characteristics are that they are easily available, easily produced and highly lethal. This category includes Nipah virus, yellow fever virus, tick-borne encephalitis viruses and tick-borne haemorrhagic fever viruses. (Jovic *ibid*, p. 367)

The main remark to some of these classifications is that they are incomplete since not all members of a given classification have been identified, thus disturbing the requirements of valid classification which includes completeness and thoroughness. There is also a question here of whether the existing classifications of biological weapons fit the possible scenarios of bioterrorist attacks. On the other hand, some classifications are even outdated and do not support the current scope of biological weapon development.

Bioterrorism typology derived from combining at least two criteria referring to the classification of biological weapons relates to unknown content: (1) object in jeopardy – people, animals or plants, then those who are capable of causing infections and diseases in people and animal, or plants and animals or even in all of them – people, animals and plants; (2) carrier – *pathogenic microorganisms* (bacteria, viruses, rickettsia, fungi and protozoa) and *toxins* (toxic products of some microorganisms, plants and animals), *insects* and some *animal* and *bird* species; (3) purpose and target – tactical-sabotaging means for covert or open use and strategic biological weapons, for public use as a rule; (4) efficiency – lethal biological agents, with disease lethality from 10% to 100%, non-lethal biological agents, with disease lethality up to 10% and biological incpacitants which are conditionally incapacitating agents in relation to personnel and flora (insects, birds, some animals); (5) according to the disease they cause – 1) *Bacillus anthraces* which causes anthrax; 2) *Clostridium botulinum* (toxin) which causes botulism; 3) *Iersinis pestis*, which causes plague; 4) *Variola*, which causes small pox; 5) *Francisella tularensis*, which causes tularaemia, and 6) *Ebola* and *Lassa* viruses, which cause viral haemorrhagic fevers, and (6) according to the characteristics biological agents are divided into three categories, A, B, and C. It should take into account at that that the international UN commission established the classification given by Centre for Control of Contagious Diseases.

The comparative analysis of the most valid existing one and the proposed classification is preceded by the comparison of biological weapon classifications known so far. The stated comparison is derived in relation to logical requirements of classification

validity. This results in the most valid existing classification and it is compared with the proposed one in order to verify the suggested classifications as a whole.

POSSIBILITIES OF BIOLOGICAL WEAPONS' USE

Terrorists would rather use biological weapons than explosives because of: high degree of lethality in people; very small quantities of pathogen can achieve strategic effects of destruction; easy and quick activation, possibility of permanent activation; inexpensive and easily available equipment, along with the fact that active living microbial cultures already exist in nature or can be ordered from some biological storage.

According to the doctrine of protagonists of the secret biological war it is of the utmost importance to choose as "rational" targets of attack of biological weapons as possible, which would have strategic importance such as: big industrial and administrative centres, the areas of gathering, regrouping and training of units, large traffic knots, important ports, liaison centres, facilities of anti-air defence, big cattle farms, big complexes with monoculture crops, etc. If terrorists would choose only sabotage-terrorist action with biological weapon in low-intensity conflicts, then the selection of targets of their attack would be: command centres, administration buildings, closed objects for sports, cultural, political and other gatherings, public transportation vehicles, big community restaurants, water supplies, grain silos, big mills and similar facilities. In all these cases the primary expected effect is psychological effect on armed forces and population.

The selection of the most desirable biological agents in relation to the characteristics of the target and facilities of the biological attack is:

- Multiple tactical targets of attack at a wide area – resistant and very resistant microorganisms with delayed effect, mostly lethal agents such as plague, glanders, anthrax, typhus fever, small pox and brucellosis.
- Primarily military facilities of attack and armed forces personnel – lethal and low-contagious or non-contagious agents such as anthrax, plague, glanders, botulinum toxins and haemorrhagic fevers.
- Close contact of aggressor's military force and his alliances (friends) with the population and armed forces of the defender, who are the target of attack – non-contagious, very non-resistant in the environment and incapacitating agents of high contagiousness with low lethality such as influenza, Q-fever, horse encephalitis, dengue, brucellosis and tularaemia.

In addition to the attack on human targets, which would by all means be in the focus of both the public and mass media, non-human targets may also be potential targets of bioterrorist attacks (Jovanivic and Micevic 2005, p. 106). This primarily refers to the use of biological agents on domestic animals and agricultural crops – agroterrorism.

Use of biological agents can cause serious infectious diseases in domestic animals. Deliberate spreading of infectious diseases in domestic animals can destroy cattle fund, which can have serious and heavy consequences on supplying population and result in the reduced quantities of meat, meat products and all other articles of animal origin.

Flora is also susceptible to harmful effects of a series of pathogenic microorganisms, insects and other herbal pests. It is well known that all around the world every year as a consequence of naturally originated plant diseases or "other circumstances" large quantities of agricultural products are wasted since flora is susceptible to a range of pathogens. If the aggressor would choose to destroy some crops, they would then make efforts to use biological weapons on the most important crop in the food chain and economy of his adversary. Such targets in Vietnam included rice fields and forests. In Serbia the most probable targets would be wheat and corn, which make 50% of the total agricultural crops.

Ecocidal form of bioterrorism causes the environmental pollution as a result of the use of biological agents, whether through direct use against the environment or as a consequence of the use of biological agents as a part of agroterrorist attack.

Conclusion

It can be stated that security threats from bioterrorism are indeed a current social problem which requires multifaceted scientific analysis. Based on the insight into scientific and expert literature, the theorists of substantive (and procedural) criminal law in most cases do not consider terrorism as a unique criminal law category, but it always includes several various crimes whose common content is that they are committed by violence or threat of violence (means), and for political reasons (motive) and that during their commitment there occurs or may occur general danger for people and property (consequence). (Milosevic 2002, p. 15)

Scientific research would contribute to better understanding and knowledge of as many facts as possible on the nature, characteristics and consequences which the use of certain biological weapon can cause. The knowledge of these problems is of great

importance for the development of strategies of prevention, suppression and management of security risks from bioterrorist attacks.

Since the consequences of bioterrorism are catastrophic (health-related, epidemiological, economic, social, political), the contemporary states should improve the mechanisms of *biosecurity of people* (protection of economy and health of people and other living beings from diseases, pests and bioterrorism), protection of the *environment* and specially *agricultural security* (protection of agricultural and food resources from agricultural terrorism and its harmful consequences).

Therefore, the states must have adequate normative-legal framework for institutionalization of national system for prevention and suppression of biological terrorism within which there would exist a specialized sub-system of opposition to bioterrorism. This should be a multi-sector body which would include specialized police units, specialized military units (CBRN defence units), intelligence services, ministry of health, sector for emergencies, sector for security of state border, inspections (veterinary, sanitary and phyto-sanitary) and scientific institutions for biological and chemical research. Furthermore, it is necessary to educate and equip such a system adequately, as well as to make it capable for early detection of a disease in plants and animals. Also, it is necessary to improve mechanisms of control of production and use of biological agents. In addition to this, it is necessary to improve health protection of the population, as well as their health culture so that they would timely report suspicious cases of diseases in plants and animals. Finally, it is necessary to improve the international cooperation in the field of monitoring, prevention and suppression of terrorism, particularly bioterrorism, agricultural terrorism, agricultural crime and agricultural diseases.

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