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## THE ROLE OF THE SERBIAN ARMED FORCES IN HUMANITARIAN HEALTH ACTION AND FIGHT AGAINST BIOLOGICAL THREATS

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*Abstract:* Due to the specific resources, available to all armies of the world within their stipulated missions, such armies play an important role in the fight against biological threats, especially the potentially most dangerous, bioterrorism. The real threat of misuse of biological agents and the possible consequences of asymmetric threats to public health, society, agriculture, economy and political stability has clearly been recognized in recent years. The Republic of Serbia is committed to giving its contribution to the global fight against this danger, given the experience it has in the care and treatment of infectious diseases, primarily of a zoonotic character that are present in our geographic area, as well as the response to crisis situations which create favorable conditions for the spread of infectious diseases. The Serbian Armed Forces and its capacities in the field of chemical, biological, radiological and nuclear services, and its medical and veterinary services which have a long tradition and experience is ready to actively participate in the implementation of the measures of prevention and response in the case of biological threats contributing to the civilian community, medical services, and society as a whole in order to protect the life and health of the population.

*Key words:* CBRN, biological agents, bioterrorism, Serbian Armed Forces.

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## INTRODUCTION

As was stated in the Oslo Declaration of 2007 “threats to health may compromise a country’s stability and security” and Labonté and L. Gagnon (2010, p. 14) argue that the securitization of health is claimed to be “a permanent feature of public health governance in the 21<sup>st</sup> century.” According to the WHO, military health services have unique capabilities that can contribute to global public health under the International Health Regulations (IHR) framework (WHO, 2005), particularly in surveillance and laboratory support (WHO, 2013). For illustration, in Peru and Thailand, military health organizations in partnership with the military of the United States use their laboratory, epidemiological, communications and logistical resources to support civilian ministry of health efforts (Chretien et al., 2007, p. 174–180). Over the last decade, military have been increasingly involved in relief activities, including sometimes providing direct assistance to crisis-affected populations (WHO, 2011). In fact, the three major health related functional areas where the military is directly involved in global health activities include: 1) medical force protection, 2) humanitarian assistance/disaster response, and 3) medical stability operations (Licina, 2011).

By participating in peacekeeping operations with medical teams the Serbian Armed Forces (SAF) contributes to global health, and through civil-military cooperation and interaction with the civilian population at the local level as well. Since 2007, the members of SAF have been engaged in multiple efforts to mitigate the damage from natural disasters (floods, earthquakes, wildfires, etc.), providing aid to vulnerable populations, road and bridge repairs, humanitarian blood donation campaigns, and providing medical assistance to the residents of rural areas (the “Military Physicians in the Countryside” campaign). During the floods which affected Serbia in May 2014, the SAF mobilized a large number of human and material resources. Between May 14 and 24 a total of 10,949 members of the Ministry of Defense and the Serbian Armed Forces were deployed on a daily basis, 802 of whom were cadets of the Military Academy. In other words, the daily average number of SAF members deployed was 912, making this the largest SAF deployment since the emergence of the SAF (in 2006). The most of the rescue operation and the affected areas recovery (primarily decontamination) was carried out by the SAF. At the request of the Republic Staff for Emergencies members of the SAF conducted a biological decontamination of over 38,500 m<sup>2</sup> terrain and warehouse space (Government of Serbia, 2014).

However, in the times we live in, humanity is threatened by great danger in the form of biological agents. Climate changes and ecological balance disorders also bring about an increased incidence of zoonotic diseases primarily of the features that can pose a great danger and thus they have a great importance from a military point of view. A large number of zoonotic agents are on the lists of

potential biological agents. Medical and Veterinary Service of the SAF has a long tradition of multidisciplinary and teamwork in the field of study of microbiological, antigenic and epidemiological-zoonotic characteristics of zoonotic agents that are widespread in our geographical area. If the biological agents were used deliberately in a potential biowarfare, primarily in bioterrorist acts, it would have incalculable consequences for the health of humans, animals, plants, the environment, as well as national and international security, and it would certainly entail economic consequences in terms of high expenditure for preparation and providing resources for detection and identification of agents, hospitalization of the diseased, injured and vulnerable, as well as for prevention measures and prophylaxis of healthy / exposed individuals.

In general, in all the wars waged so far, 12 times as many people died of infectious diseases than from weapons, so that the biological agents are a real enemy of our civilization, as evidenced by the current epidemiological situation in the world related to the occurrence of Ebola virus as well as HIV and their consequences. Lessons learned from the recent civil war in the former Yugoslavia point to the incidences of diseases whose causes are on the lists of potential biological agents such as tularemia, brucellosis, hemorrhagic fevers with a renal syndrome in the war-affected areas. These are zoonotic agents, which, as previously stated, have complex ecological cycles. The former Yugoslavia is an endemic area for most of the diseases mentioned, and the Army entering into natural foci, poor hygiene and sanitation in times of war and a great expansion of the rodent population all has contributed to the occurrence of such diseases. However, there were also concerns that it was a case of the use of biological agents, also made more real by the objective fact that because of such an undercover operation it cannot be easy to prove and make sure a biological attack is in progress. In this connection is precious and unique experience related to the occurrence of smallpox in the former Yugoslavia in 1972. Efforts against such threats or risks are described in Oslo Declaration as ‘national health security, “a variation of a government’s overall obligation to defend ‘the state from external attack’ (Oslo Ministerial Declaration, 2007).

### **USE OF BIOLOGICAL AGENTS AS A POTENTIAL TERRORIST TOOL**

Bioterrorism involves the intentional use of biological agents-organisms (bacteria, viruses, fungi, protozoa) and their products-toxins from the political, economic, ideological, religious and other reasons (Ristanović, 2013). It is a threat as old as human society and civilization as a whole. According to available data the first use of biological agents as weapons has been reported as early as the sixth century B.C. when contamination of water supply with the fungus *Claviceps*

*purpurea* (rye ergot) by the Assyrians had been reported. In contemporary world the most significant biological attack was the intentional contamination of restaurant salad bars with *Salmonella* by a religious cult in Oregon in the United States in 1984. More recently, in September 2001, the American public was exposed to anthrax spores as a bio-weapon delivered through the US postal system. The centre for disease control and prevention (CDC) identified 22 confirmed or suspected cases of anthrax during this attack. These included 11 patients with anthrax through inhalation, of whom five died (Das & Kataria, 2010, p. 255).

Today, thanks to the development of molecular biology, genetic engineering and biotechnology, bioterrorism can get scary dimensions. It is possible to modify the existing microorganisms in order to prevent their detection and identification, to increase their resistance to drugs (bacterial strains resistant to several dozen types of antibiotics), vaccines, antidotes and environmental factors (heat, UV radiation), cross the existing (eg. ebolapox virus) and produce completely new biological agents that could selectively and in a controlled way impact a particular nation, population or a target group. Incidentally, such experiments have already been performed in the laboratories of the most powerful countries in the world during the Cold war, which at one point threatened to turn into the race to develop biological weapons, and the very awareness of biological hazards led to the signing of the biological Convention, which entered into force in 1975. Despite the Convention, work on improving biological weapons continued in the so-called defensive and defending purposes.

In today's world of global contradictions, there is a growing concern worldwide that terrorist organizations and individuals, or even some states could use micro-organisms or their products-toxins, as their weapons.

#### CDC Classification of Bioterrorism Agents (Das & Kataria, 2010, p. 257).

Category A agents	Category B agents	Category C agents
<ul style="list-style-type: none"> <li>• <i>Bacillus anthracis</i> (anthrax)</li> <li>• <i>Clostridium botulinum</i> toxin (botulism)</li> <li>• <i>Francisella tularensis</i> (tularemia)</li> <li>• <i>Variola major</i> (smallpox)</li> <li>• <i>Yersinia pestis</i> (plague)</li> <li>• Filo viruses</li> <li>• Ebola virus (Ebola hemorrhagic fever)</li> </ul>	<ul style="list-style-type: none"> <li>• Alpha viruses</li> <li>• Eastern and western equine encephalomyelitis viruses (EEE, WEE)</li> <li>• Venezuelan equine encephalomyelitis viruses (VEE)</li> <li>• <i>Brucella</i> species (brucellosis)</li> <li>• <i>Burkholderia mallei</i> (glanders)</li> <li>• <i>Coxiella burnetii</i> (Q fever)</li> </ul>	<ul style="list-style-type: none"> <li>• Hanta viruses</li> <li>• Multidrug-resistant tuberculosis</li> <li>• Nipah virus</li> <li>• Tickborne encephalitis viruses</li> <li>• Tickborne hemorrhagic Yellow fever</li> </ul>

Category A agents	Category B agents	Category C agents
<ul style="list-style-type: none"> <li>• Marburg virus (Marburg hemorrhagic fever)</li> <li>• Arena viruses</li> <li>• Junin Viruses (Argentinian hemorrhagic fever) and related viruses</li> <li>• Lassa viruses (Lassa fever)</li> </ul>	<ul style="list-style-type: none"> <li>• Epsilon toxin from <i>Clostridium perfringens</i></li> <li>• Ricin toxin from <i>Ricinus communis</i></li> <li>• Staphylococcal enterotoxin B</li> </ul> <p>A subset of Category B agents includes pathogens that are food and waterborne. These pathogens include but not limited to:</p> <ul style="list-style-type: none"> <li>• <i>Cryptosporidium parvum</i></li> <li>• <i>Escherichia coli</i> O157:H7</li> <li>• <i>Salmonella dysenteria</i></li> <li>• <i>Vibrio cholerae</i></li> </ul>	

Table 1 shows the classification of potential biological agents, according to the CDC, Atlanta. If the biological agents are used in unmodified form, they are very cheap, readily available (laboratories, hospitals, biological material of human and animal origin) and portable, so they can be used with the aim of causing illness and death of human beings, animals or plants. Biological agents can be easily and effectively combined with other agents (chemical, nuclear, explosives). Also, we should not neglect the so-called agro-terrorism and consequences of the use of biological agents against plants and animals that can also cause immense environmental, health and economic consequences (foot-and-mouth disease epidemics in the UK, 2001). Agriculture is a “soft target”, easily vulnerable and hard to defend, and the effects of the use of such agents would be immeasurable. It is therefore not surprising that in developed countries, special attention is paid to the defence from agro-terrorism. And given the fact that genetic engineering and biotechnology are undergoing their expansion, numerous issues have also been posed related to the so-called genetically modified foods. If we also add to this cyberterrorism, as well as all the possibilities that today’s information technology provides and the possible information dissemination abuse, it is clear that in an eventual bioterrorist act the psychological aspects and impacts on mental health would be also significant, as well as the scope of manipulation. In order to prevent the above-mentioned it is necessary to react as efficiently as possible in terms of prevention and response to an eventual terrorist act so that the consequences should be as little as possible.

In the event of a possible attack, it is necessary to more efficiently perform the detection and identification of an agent used, and the treatment of patients and exposed should be implemented in accordance with the defined guidelines. All relevant institutions at a local and national level (health, police, civil defense units, with the obligation of public-private partnerships), and if necessary, at the international level, should be involved in the processes of preparation, treatment and recovery, that is, taking care of the consequences of an attack. To address this threat, it is necessary to make great efforts at the national and international level, which includes raising the awareness of the public and decision-makers about the threat from today's bioterrorism, respect all international obligations stemming primarily from the Convention on the Prohibition of the use of biological agents and toxins, conform to and implement appropriate legislation, promote international cooperation in this field, boost intelligence and security measures and transfer control of potential biological agents and hazardous substances, strengthen epidemiological-epizootologic surveillance, improve standards of biosecurity and biosafety and provide resources to enable the detection and identification of possible biological agents and dangerous pathogens, primarily define a strategy how to act in the crisis caused by the use of potential biological agents and also the strategy concerning tasks and obligations of all entities (intelligence and security, NBC, medical, veterinary, agricultural, academic, media sector). It is also necessary to strengthen the capacity of crisis management and crisis communications.

### **AVAILABLE RESOURCES OF THE REPUBLIC OF SERBIA IN RESPONSE TO THE USE OF BIOLOGICAL AGENTS – THE ROLE OF THE SAF**

Public health institutions that make up the (health centers, hospitals, institutes, clinical hospital centers, pharmacies) in the Republic of Serbia performing health activities in primary, secondary and tertiary levels have a legally established network throughout the territory of the country (Official Gazette of RS, 107/05) . Although in their daily work and responsibilities, they deal with controlling the activities of biological agents with medical-epidemiological aspects, objectively largest operational resources for prevention and response to the use of biological agents are within the Army. The capacities that each country's army has for Nuclear Biological and Chemical Defence are developed predominantly for their own needs, but through civil-military cooperation they are also taken into consideration in emergency conditions, which would certainly be the use of biological agents or appearance of a larger outbreak of infectious disease.

Catastrophic floods in the whole region and in particular the Republic of Serbia<sup>4</sup> in May 2014 featured in the recovery stage the consequences of a lack of awareness of the need for monitoring the occurrence of microorganisms in floodplains and the threat of a possible outbreak of epidemics, especially zoonoses, vector and natural focal infections. Also as unlikely, but possible worst case scenario relates to microorganisms used by terrorists in such circumstances, since a crisis situation such as the above-mentioned provides excellent conditions for such activities. Analysis of possible scenarios raised the issue of the existing organization set-up and the capability to respond to that kind of risk.

The Republic of Serbia wishes to improve and promote its national capabilities for protection against radiological, nuclear, biological and chemical weapons (CBRN) threats including B agents. CBRN Defense of the SAF is designed as a general purpose service for all arms and branches. Functioning of SAF CBRN Defense Service includes CBRN measures on the level of all tactical units (so called “general CBRN measures”), and on the level of CBRN units (so called “specialized CBRN measures”). SAF CBRN Defense System consists of CBRN Trainig Center (TC) within Training Command, and 246.batalion CBRN within Land forces. There are also CBRN officers as CBRN advisers, in the SAF operational brigades. On the experts field of functioning CBRN TC and 246.bCBRN use capacities of the Military Technical Institute, Technical Research Institute and National Poisoning Control Centre of the Military Medical Academy which are under Serbian MOD, and with other civilian governmental institutions (Republic of Serbia, Ministry of Defence, 2015).

According to Partnership for Peace, Presentation document of Republic of Serbia the existence and development of a national but also the regional Center for training of CBRN staff created the conditions for training, joint international engagement of teams, the study of national mobile training teams and instructors, as well as support to civil authorities in the country and the countries of the region and Europe. The significance of the Center shows the number of students of various courses in the period from 2009 to 2014. European countries - 243 participants; African countries - 33 participants.

Engagement SAF and 246.batalion CBRN in case of bioterrorist attack is based on the Constitution of the Republic of Serbia (Article 139, 140 and 141), the Law on Defence (Article 41), the Law on the SAF (Article 2), the Law on

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<sup>4</sup> In the period from May 14 to May 23, 2014, as a result of unprecedented flooding, a state of emergency was declared throughout the territory of the Republic of Serbia. A total of 16 districts were affected, about a third of the territory of Serbia, more than 31 000 people were evacuated, several thousand houses were destroyed or damaged as well as 350 public office buildings, 280 bridges, hundreds of roads, the flood washed away part of the railway in the length of 10km. The flood wave diminished the reliability of the system for the generation and transmission of electric power and jeopardized the stability of the power system of Serbia.

emergency situations (Article 12) and Functional doctrines SAF. Considering the importance of participation SAF in emergency situations, the legislator has predicted that in cases where it is necessary to rescue people and property, as a result of natural disasters, technical and technological accidents and other hazards, the order may be issued by the Chief of the General Staff, the commanders of operational level and commanders of brigades.

A special and specific resource represent also the capacities of the Military Medical Academy (MMA), which in the context of an integrated facility occupies an area of 180,000 square meters, where the annual medical check undergo 600,000 people, 30,000 of them are hospitalized, about 20,000 surgical interventions as well as approximately 3,000,000 million of laboratory and diagnostic procedures are performed and accommodation capacity amounts to 1200 beds. The Military Medical Academy has 27 clinics and 17 institutes with powerful diagnostic centers and polyclinics (Jeftić, Ristanović et al. 2011, p. 50-51). It is particularly significant that within the MMA operates the Poison Control Center which is the national referral and an important pillar of the state in all accident situations. With regard to the detection and identification of microorganisms are significant human and technological capacities of the Department of Preventive Medicine of the Military Medical Academy, primarily the Institute of Microbiology and Epidemiology Institute, as well as accommodation capacities of the Infectious Diseases Clinic and other organizational units of the MMA.

However, given the specificity of biological agents, their contagiousness and the possibility of aerosol application for the detection and identification of biological agents Class 1 and 2, according to the CDC classification, and treatment of the infected and sick from these agents it is necessary to improve the mobile capacities and strengthen the standards of biological safety in laboratories and hospitals, as well as to define and provide adequate isolation facilities.

In addition to the above-mentioned, the military health care system within its jurisdiction has four institutions of secondary level and a large number of health facilities of the primary level of protection, which, together with the resources available in terms of the troop military ambulance makes an indispensable resource for a response to any health problem, including a terrorist attack.

The synergy that exists in the Republic of Serbia has primarily been reflected through the capacities available to the Ministry of Defense, and also through the possibility of an adequate training within the Army and medical care and hospitalization offered by the military health system, providing an opportunity for not only the national but also the regional response to potential misuse of biological agents.

Given that this is a very important resource, but the systemic response to the risk would require inter-sector cooperation and coordination. In order to achieve a



satisfactory level of preparedness it is necessary to establish inter-agency cooperation and networking of both military and civilian capacities aimed at developing the capacity of the public health system and other relevant institutions for the prevention and reduction of the potential consequences of a biological terrorist attack.

Therefore, there is a clear desire and need of the Republic of Serbia to improve and promote its national capacity for the protection of biological agents in order to affirm the clear commitment of our country to make its full contribution to the fight against terrorism and strengthening primarily regional cooperation, as well as resources for participation in International Peacekeeping Missions.

## CONCLUSION

In the theory of warfare the biological weapon has long been regarded as an asymmetric threat and the atomic bomb of the poor, because of the simple and inexpensive production and the possibility of a hidden, but effective and specific use. Although a biological warfare has not been publicly waged so far, bioterrorism as a permanent phenomenon and a social phenomenon has been constantly changing its form and adapting to the technological and scientific aspects of time in which it appeared. Nowadays it is a specific threat, risk and challenge from the security, public health, economic and political standpoint. Preventing and responding to potential bioterrorism act implies raising awareness, continuous improvement of legislation, improving intelligence and security measures, transfer control of potential biological agents and dual-use goods at all levels, strengthening the resources and capacity to detect and identify potential biological agents and treatment in the event of their occurrence. Multidisciplinary and team approach is necessary to achieve these objectives with clearly defined duties and responsibilities of all concerned. The Army of Serbia, with its capacity (CBRN service, medical and veterinary services and other resources) within its defined missions and tasks is ready to give its full contribution and actively participate in protecting the population from the consequences of a possible bioterrorist act, and by active engagement in regional and international framework it is also capable of contributing to the fight against this global scourge.

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## **ULOGA ORUŽANIH SNAGA SRBIJE U HUMANITARNOJ AKCIJI ZAŠTITE ZDRAVLJA I BORBI PROTIV BIOLOŠKIH PRETNJI**

*Apstrakt:* Usled posebnih izvora dostupnih svim armijama sveta u okviru ostvarenja svojih strateških zadataka, one igraju značajnu ulogu u borbi protiv bioloških pretnji, naročito onih potencijalno najopasnijih—*bioterrorizma*. Danas postoji stvarna pretnja zloupotrebe bioloških agenasa čije bi posledice predstavljale asimetričnu pretnju javnom zdravlju, društvu, poljoprivredi, ekonomiji i političkoj stabilnosti, i ona je jasno prepoznata tokom nekoliko prethodnih godina. Republika Srbija je opredeljena da da svoj doprinos globalnoj borbi protiv ove opasnosti polazeći od iskustva koje ima u prevenciji i tretmanu zaraznih bolesti, prvenstveno onih sa životinjskim poreklom prisutnih u našoj geografskoj oblasti. Ona ima spreman odgovor i u kriznim situacijama koje stvaraju pogodne uslove za širenje zaraznih bolesti. Oružane snage Srbije sa svojim kapacitetima u hemijskoj, biološkoj, radiološkoj i nuklearnoj oblasti, kao i dugogodišnjom tradicijom i iskustvom u pružanju medicinskih i veterinarskih usluga, spremne su aktivno da doprinesu primeni mera prevencije i odgovora u slučaju bioloških pretnji, pomažući civilnoj zajednici, medicinskim službama i društvu u celini, sa ciljem zaštite života i zdravlja stanovništva.

*Ključne reči:* CBRN, biološki agensi, bioterrorizam, Oružane snage Srbije.

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