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Chemical and biological weapons a real threat in the armed conflict of Russia and Ukraine

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Abstract

Objectives: The purpose of the article was to present Russia's activities in terms of the production of biological and chemical weapons, and her research into the effects of its use. In the light of the goal defined in this way, the research problem was formulated, which is presented in the form of a question: is it likely that Russia will use biological or chemical weapons in its war with Ukraine?

Methods: Test methods used in the research process mainly included an in-depth analysis of source materials - legal acts, compacts and scientific articles concerning the operation of plants producing weapons of mass destruction in Russia.

Results: Findings confirmed the adopted hypothesis, that Russia has both biological and chemical weapons, and the capabilities to use them. From the day of the armed attack on Ukraine, Russia has been committing various provocations, aimed at justifying the possible use of this deadly weapon. To verify the hypothesis put forward earlier, an in-depth analysis of Russia's previous activities focused on the production and research of weapons of mass destruction and the observation of the course of the ongoing war was required.

Conclusions: The conclusions of the conducted research indicate on the likelihood of Russia using biological or chemical weapons in the ongoing military conflict with Ukraine, resulting from the dynamics of the war, the deteriorating economic situation in Russia and the imposition of increasingly stringent sanctions against it.

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Introduction

Weapons of mass destruction are the most terrifying type of weapons, and the galloping technological progress has meant that the scale of damage caused by their use could reach the highest level. Of great importance is also easier than before access to this type of weapon, and the possibility of its use. After the attack on the Word Trade Center in 2001, the international community's desire to eliminate weapons of mass destruction from the arsenals of countries in its possession has intensified. These actions resulted from the fear of using this type of weapon in another terrorist attack. The experiences of September 11, 2001 made people more and more afraid of radical Islamic organizations, disregarding the fact that the threat may come from a different side, and Poland will be closer to the aggressor than she might expect. On February 24, 2022, Russia invaded Ukraine. To date (as of August 17, 2022), 5,514 Ukrainian civilians and several thousand soldiers have died in the war with Russia, and over 10.3 million refugees have left their homes in Ukraine seeking refuge in another country. More than 43,000 Russian soldiers also lost their lives.The scale of the destruction is also alarming, growing with each day of the war. By attacking Ukraine, Russia violated the norms of international law, which was strongly condemned by Western countries. Therefore, the necessity of introducing tough sanctions against Russia and Belarus, which supports it, aimed at stopping the aggression against Ukraine, was recognized. Western powers also pledged to support Ukraine with heavier weapons - air defense systems and long-range artillery. Russian forces do not mince their resources, and the world is talking more and more about war crimes. The collected evidence shows that the genocide was committed in cities on the outskirts of Kiev. The victims were not only soldiers but also civilians. Old men, women and children are murdered in a brutal way. The dynamics of the war and the tactics used in it do not exclude the worst-case scenario, which is the likelihood of Russia using weapons of mass destruction.

1. Biological weapon

Weapons of mass destruction are classified as one of the deadliest means of combat, as the consequence of their use is mass death in a very short time. Due to the effects that the use of biological weapons can cause, it is considered to be one of the most dangerous combat agents. Its attractiveness is influenced by the following factors:

- relatively low production costs,
- the range of destruction that is very difficult to predict,
- extremely fast increase in morbidity,

- inability to quickly diagnose the factor causing illness and death,
- lack of effective drugs and vaccines,
- huge number of deaths,
- a variety of symptoms that make it possible to accurately diagnose the disease during its development.

Biological weapons are not only combat agents, they are also tools and methods used to carry them (devices spraying and disseminating toxic biological substances and spreading diseases in animals). M. Żuber in his book writes that not only viruses or bacteria could be used in the production of biological warfare agents. Rickettsiae, pathogenic fungi, as well as bacterial, plant and animal toxins are also extremely dangerous. Technological progress has contributed to enormous changes in the ways of delivering biological weapons. Rocket heads and materials used to fill air bombs were modernized. Therefore, biological weapons have become an even greater danger, and the effects of their use may pose a threat to the health and life of even several generations. After analyzing the literature on the subject, it is also possible to conclude that biological weapons are the most effective, the easiest to hide, and cheap to manufacture weapons, which, with a relatively low expenditure of resources, could contribute to mass losses in people.

2. Classification of pathogens

In 2000, the Centers for Disease Control and Prevention of the US Department of Health divided bacteria (which can be used as biological weapons) into three groups. The classification was made taking into account the risk that the given bacteria could pose to health. The so-called "dirty dozen" are bacteria, viruses and toxins, which can be relatively easily produced in huge amounts, those showing little sensitivity to external conditions, suitable for spreading. Category A is the highest priority pathogens due to:

- significant impact on the health of the society,
- causing high mortality,
- easy to move from person to person,
- determination of public services to extraordinary preparations and activities,
- creating panic among the public.

The so-called pathogens are classified into category B. Second-order highest priority. These pathogens exhibit the following characteristics:

- cause low morbidity and mortality,

- require intensive supervision over the course of diseases,
- spreading them is relatively easy.

The so-called pathogens of the highest tier priority are in category C. Pathogens in this category are pathogens that can be genetically manipulated for massive future spread because of:

- ease of spreading,
- high ability to cause high morbidity and mortality,
- public access.

3. Chemical weapon

In the literature on the subject, we find many definitions of chemical weapons, and their diversity results from the domain of the subject that defines them. In the PWN encyclopedia we read that chemical weapons are poisonous warfare agents and means of their delivery. Combat chemicals are filled with bombs, rocket heads and tanks spraying various types of artillery shells. Biological weapons are gaseous, liquid and solid substances. Due to the large area and time of operation, as well as massive combat effects, chemical weapons are classified as weapons of mass destruction. Getting into the human body through the mucous membranes, skin, eyes, respiratory or digestive tract, it may result in temporary or permanent incapacitation and even fatal paralysis. In 1925, the Geneva Protocol banned the use of chemical weapons, but intensive research into new poisonous agents was continued, and the effectiveness of the impact on human organisms was improved in order to reduce the dose necessary to kill a potential victim. sprzęt skonstruowany do zastosowania broni chemicznej. Both the means of delivery and the methods of bringing lethal agents into combat have been improved. The aim of these activities was to make chemical weapons the most effective type of weapon in armed combat. The international convention prohibiting the production, development, storage, transfer, acquisition and use of chemical weapons, signed in Paris on January 13, 1993, defines what types of warfare agents are classified as chemical weapons. These are:

- ammunition and all devices designed to lead to destruction or death by means of chemical compounds,
- toxic chemicals.

4. Classification of poisonous warfare agents

When analyzing the historical records of wars, it can be stated that they used various types of poisonous agents. The division of poison warfare agents was made taking into account various criteria:

- physical condition,
- the time when the first symptoms appear,
- chemical parameters,
- field resistance,
- tactical use,
- effects on the body.

Taking into account the impact of chemical warfare agents on the human body, they have been divided into:

- tearing agents (e.g. chloroacetophenone)
- incapacitating (e.g. LSD-25),
- lethal (e.g sarin, sulfur mustard).

The most important criterion influencing the assessment of the impact of toxic warfare agents on a living organism is the toxicological criterion in which the following groups have been specified:

- paralytic and convulsive (e.g. sarin),
- general toxic (e.g. hydrogen cyanide),
- toxins (e.g. botulinum toxin),
- stinging (e.g. sulfur mustard),
- suffocating (e.g. phosgene),
- psychotoxic (e.g. SLD-25),
- irritants (e.g chloroacetophenone).

In general, toxins are included in the group of biological agents, but due to the fact that some of them can only be obtained by chemical means, they are classified as chemical agents.

5. Soviet program of bio-destruction

With the aim of universal and complete disarmament, elimination of all types of weapons of mass destruction, prohibition of production and stockpiling of biological and chemical weapons, international conventions on the prohibition of the production of biological weapons have been established. Sygnatariuszem konwencji była również Rosja, jednak nie powstrzymało jej to przed przygotowaniami do ofensywnej wojny z użyciem tego rodzaju

broni. Pod koniec XX wieku powstał najpotężniejszy na świecie, wojskowy kompleks biologiczny Związku Radzieckiego, mogący doprowadzić do zagłady świata. Bolshevik ambitions to possess the ultimate weapon for a world revolution determined Soviet biologists to conduct research on the germs of diseases that were decimating the armies of World War I. Research was conducted on the germs of smallpox, plague, typhus, typhoid fever and Siberian fever. The latter particularly attracted the attention of Russian military researchers, which was due to the fact that they spread easily to animals and humans, via the skin, pulmonary and digestive routes. This extremely dangerous infectious disease broke out in Siberia in the 18th century, and its effects lasted over a hundred years. The research on the above-mentioned germs was carried out by the Russian concern - Biopreparation, whose official goal was the production of serums, drugs and vaccines. The biopreparation consisted of over 40 laboratories and plants, as well as an undefined number of military facilities. Formally, the concern was subordinate to the ministers of health and agriculture, while the actual supervision over the biopreparation was exercised by the 15th Main Board of the General Staff, responsible for the preparation and implementation of the biological attack.

In the Military - Industry Committee sat the ministers responsible for the defense industry. The commission was directly subordinate to a member of the Politburo, who was responsible for national defense matters, and was divided into boards that dealt with various branches of the defense industry. Both the production and development of biological weapons were managed by the management of biological weapons. The Special Biological Group was subordinate to the Operational Board of the General Staff of the Ministry of Defense. The Special Biological Group was responsible for the doctrine of war and the logistics of using biological weapons. Both the production and development of biological weapons were managed by the management of biological weapons. The Special Biological Group was subordinate to the Operational Board of the General Staff of the Ministry of Defense. The Special Biological Group was responsible for the doctrine of war and the logistics of using biological weapons. Its special units were responsible for the security of biological weapons production facilities. In the event of a war, an attack with biological weapons would come from the military units of the Strategic Missile Force and the air force. Although the Biopreparation maintained control over the biological weapons arsenal and the most important defense plants in the sector, the following facilities were still under management:

– Irkutsk region - Winter railway station. Stocks of anthrax-based biological weapons were stored here.

- Institute of Virology in Siegijew Posad (formerly Zagorsk), where weapons based on Bolivian haemorrhagic fever, smallpox, Ebola, Marburg, Argentine haemorrhagic fever, Lassa fever, Venezuelan equine encephalitis and fever from the Great Rift Valley were researched and developed. In addition, there were studies on viral encephalitis - Saint Lovis, eastern equine, western equine and tick-borne encephalitis. The employees of the institute also dealt with the production and storage of smallpox.
- Two important centers operated in Kirov and its region. Institute of Microbiology, where biological weapons based on anthrax, melioidosis, brucellosis, glanders, tularemia, typhus and Q fever were developed. The institute also produced and collected plague germs. The last of the buildings built by the 15th Management was built in Striżi. It dealt with the production of viruses and bacteria.
- Another important factor in the activities of the 15th Management Board was the training ground where substances were tested to stimulate chemical and biological weapons. This training ground was located in Szychany (a swarm of the Volga River).
- There was also an air force base in the same region. Presumably, it was intended for the use of biological weapons during the war in Afghanistan.
- Research on biological weapons was also conducted at a proving ground in Kazakhstan (Rebirth Island).
- Research on anthrax (and its storage) and glanders was also conducted at the Institute of Military Technology Problems in Sverdlovsk (now Yekaterinburg). Work was also carried out at the institute on tularemia, melioidosis and botulism toxin.
- In Nukus, part of the Karakalpathian Republic, the effects of agents simulating both chemical and biological weapons were investigated.
- Equipment for the production of biological weapons was manufactured at the Institute of Security Technology, located in Moscow. In the vicinity of this city, bombs and warheads with biological weapons (Reutow) were also stored. The cargo, personnel and animals were transported to the testing grounds from the Kubinka military airport in the Moscow region.

The above-mentioned Biopreparation was officially responsible for the facilities conducting research on biopesticides, vaccines, as well as hospital and laboratory equipment. These objects were civilian objects. Unfortunately, the reality was different. Biopreparat dealt with the program developing the production of biological weapons, led by the Institute of Military Microbiology. Several thousand tons of deadly pathogens were produced annually in the biopreparation. The staff of the Biopreparation mainly came from the 15th Board of the

General Staff (they were in charge of the institute). The biopreparation was responsible for the preparation and execution of the biological attack. This powerful concern consisted of over 40 laboratories and plants that were formally subordinate to the ministers of health and agriculture (in the mid-1980s, Biopreparat was subordinated to the Ministry of Medical and Microbiological Industry). The most important of the Biopreparation facilities include:

- Moscow Institute of Biological Apparatus Design, which dealt with work on devices designed for the detection of biological weapons and the construction of equipment for biosafety.
- The Design Institute "Gipobioprom" located in Moscow, dealing with the design of facilities for research and production of biological weapons.
- The Institute of Applied Biochemistry was also located in Moscow. It developed the production of biological weapons and designed equipment for the production and testing of biological weapons.
- The design and manufacture of equipment for the production and testing of biological weapons was also dealt with in a special Design Office for Control and Automation Devices - Joszkar Oła.
- In Berdsk there were: Technological Institute of Biologically Active Substances, Scientific and Production Base and a production plant. The Institute dealt with the development of enzymes for research into genetically modified biological weapons. The Scientific and Production Base developed laboratory techniques for the production of biological weapons containing brucellosis and developed methods of filling the warheads with biological weapons. The production plant in Berdsk was used as a backup in case of mobilization. They dealt with brucellosis, glanders, plague and tularemia.
- A backup production plant was also established in Omutninsk. This plant was intended for the production of plague, tularemia and glanders. There was also a Science and Production Base in Omutninsk, where research on plague and tularemia was carried out.
- Another reserve facility for the production of biological weapons was the "Progress" Science and Production Base. The production of biological weapons was mainly based on anthrax, but the plant was also prepared to produce weapons containing glanders, tularemia and plague. The plant was also prepared to conduct tests on anthrax, glanders and Marburg. Its seat was in Stepnogorsk.
- Biosynthesis plant was also designated for the production of powdered anthrax weapons. Like the above-mentioned ones, it acted as a backup in the event of mobilization.

There were also many other facilities under the care of Biopreparation, which prospered in Koltsov, Kurgan, Leningrad (now St. Petersburg), Łubyczany, Obolensk and Vilnius. They developed weapons resistant to vaccines and weapons targeting the central and peripheral nervous systems. They also conducted research on biological factors that are supposed to weaken the human immune system. In addition to the laboratories controlled by the XV Main Board, there were laboratories subordinate to the Ministry of Chemical Industry, the Ministry of Health, the USSR Academy of Sciences and the State Security Committee. In 1927, Soviet Russia became a signatory to the Geneva Protocol banning the use of biological weapons. Unfortunately, this protocol did not prohibit the production of these weapons, which the Russian military used to continue the work started in 1924. Information about the Soviet program reached the West only in 1983, after one of the biopreparation scientists escaped to Great Britain. It was then that international pressure on Mikhail Gorbachev aimed at persuading him to stop producing pathogens. In 1990, the production of lethal pathogens was stopped by Gorbachev's decision, but the Russian military opposed the order to eliminate their resources. The closure of military laboratories took place only as a result of a request by Boris Yeltsin in 1992. Unfortunately, three laboratories were left in the hands of the Russian Army, in which active samples of all types of biological weapons remained closed. According to the Russian military, it was necessary to produce vaccines in the event of a possible bioterrorist attack. Due to the inability to conduct proper supervision of international institutions over the former Soviet laboratories, Russia is perceived as a superpower that can use biological weapons to achieve the intended goal. Concerns about the use of biological weapons by Russia are compounded by the alarming results of research conducted by American military biologists who, at the beginning of the 21st century, conducted research on samples of germs deactivated in 1992. Studies have confirmed that the bacteria are not only still active, but have become more dangerous than they were when they were inactivated, due to their spontaneous mutation.

Conclusion

Biological and chemical weapons are among the types of weapons of mass destruction most often used in combat operations. During armed confrontations, they were also used against civilians, which was to weaken the will to fight of the attacked societies. These activities led to the emergence of epidemics that were difficult to fight, with mass death and many years of tragic consequences. Deadly pathogens were used during the Cold War, and they were also popular with terrorist groups. It is not difficult to imagine both the scenario of a potential attack with a biological weapon as well as the long-term effects of this attack at a time when the world

is still struggling with the pandemic caused by the SARS-CoV-2 coronavirus. Weapons of mass destruction, especially biological substances, have become a widely analyzed topic in the context of the possible use of them by Russia in the fight against Ukraine. The biological weapons used by Russia could be used to contaminate food, soil or water supplies. Military facilities or places with civilians can become the targets of attacks. Observing the course of the ongoing war in Ukraine, it can be stated that Russia, which uses all possible tactics in this armed struggle, is able to use any weapon at its disposal to achieve the intended goal. Due to the resolute Ukrainian resistance and aid from Western countries to Kiev, the progress of the Russian troops is slow and entails heavy losses, despite the accumulation of forces in selected sections. Nevertheless, the Kremlin has not yet decided to significantly escalate the conflict by announcing a general mobilization or using weapons of mass destruction, but this scenario is still possible. Russia has reduced the scale of its ambitions in terms of territorial gains in Ukraine and is seeking to capture land that could create the appearance of victory, but the situation may change. Putin is trying to lead an economic and humanitarian invasion, aiming at the greatest possible cost on the side of Ukraine and the West that supports it, which would ultimately lead to political concessions to Moscow. Russia, aware of the problems with achieving the highest military and political goals in the current phase of the conflict, is also trying to implement another plan, which is to permanently ruin Ukraine. Despite the fact that there has not yet been a significant escalation of missile attacks by the aggressor, they are constantly and systematically carried out in various parts of Ukraine. Local artillery strikes lead to total destruction of infrastructure, including civil infrastructure. The protracted conflict will lead to a further deepening of the economic crisis as well as to a humanitarian catastrophe in Ukraine. Russia has deliberately officially made its possible actions to unblock Ukrainian exports dependent on the lifting of some Western sanctions. Moscow's intention is to lead to a slow economic, social, and even political destabilization of Western states as part of its war with the West. Russia assumes that the combined effect of increasing material and human losses in Ukraine, energy, migration, economic and food crises in Europe, the USA and other regions of the world will gradually lead to a change in the attitude of Western countries towards the conflict, and therefore they will start to exert political pressure on Ukraine, aiming to end it as soon as possible. The above situation depends on many factors, the ability and determination of Ukrainians to resist Russia, the scale and systematic nature of Western support for the attacked country, and the scale of resilience and the level of political stability of not only Western countries, but also Russia. Western sanctions will probably not lead to internal destabilization of Russia, nor will they affect its policy towards Ukraine. Increased state

propaganda, the destruction of independent media, the taming of manifestations of opposition activity and the intimidation of the political elite in the absence of open divisions that could threaten the Kremlin, as well as the gradual transition of the economy to a military-mobilization model, increase the Russian authorities' room for maneuver in aggressive external policy. The current state of affairs suggests that the Putin group, which is dominant in Russia, will not give up its political goals regarding Ukraine. Russia's plan is not only to gain territorial gains, but also to transform Ukraine into a failed state, fully subordinated to Russian political and military pressure. Military experts say that the weakening military potential, which prevents the achievement of the maximum goals during the current offensive, may contribute to the conflict turning into a war of exhaustion, a war that may continue for many years, especially since the war with Ukraine is a key element for Russia. destroying the political order and security in Europe as part of his long war with the West.

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