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Understanding and Awareness Among the Czech Public Regarding the Potential Deployment of Biological Weapons on their Territory

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Abstract

This study, conducted in the Czech Republic, undertakes a multidisciplinary examination of public perceptions regarding biological weapons, identifying significant gaps in educational and preventative measures. Although general awareness of biological weapons is relatively high, there is a significant lack of in-depth understanding and knowledge about the specific aspects and consequences of their use. The analysis included a quantitative survey that illuminated the insufficient public knowledge about specific biological agents and strategies for defense and response to biological threats. The study also identified a significant gap in media coverage of this topic, resulting in a low level of public discussion and perceived urgency. Furthermore, the role of educational programs and information campaigns that could significantly contribute to increasing awareness and preparedness for potential bioterrorist attacks was explored. The study recommends intensifying educational activities and integrating the topic of biological weapons into broader security and health education programs. Emphasizing the significance of a holistic strategy toward public enlightenment and bolstering national readiness against biological hazards, this research lays a foundation for continued dialogue and measures. It aims to evaluate the level of awareness and preparedness among Czech Republic citizens for potential incidents involving biological weapons, amidst growing attention to biological risks fuelled by geopolitical tensions and advancements in biotechnology. The conclusions of this work highlight the urgent need for deepening national and international cooperation in monitoring, prevention, and response to threats associated with biological weapons, to increase society's resilience against these invisible, yet devastating, threats.

KEY WORDS: *biological weapon, weapons of mass destruction, biological agents, security, bioterrorism*

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1. Introduction

In today's world, marked by rapid technological advancements and complex global security challenges, the specter of biological weapons (BW, "B-agens") looms large in the strategic considerations of national and international security entities. The recent global events, most notably the COVID-19 pandemic, have not only highlighted the vulnerabilities of modern societies to biological threats but have also accelerated the pace of biological research, raising both hopes and fears about the future of biotechnology. This juxtaposition of advancements and their potential misuse underscores the critical need for heightened awareness and preparedness at all levels of society.

Humanity's journey through the ages has been punctuated by incredible discoveries that have gradually permeated all aspects of life. While science achieves remarkable breakthroughs daily across various disciplines, not all outcomes of scientific endeavor—especially applied sciences—prove beneficial or positive for mankind. A prime example of this is the development of weapons of mass destruction (WMDs), including nuclear, chemical, biological, and radiological weapons, which represent a colossal global risk due to their potential to cause widespread destruction and disrupt peace.

Biological weapons hold a unique and insidious place within the arsenal of WMDs due to their ability to harness pathogens to incapacitate or kill large populations discreetly and effectively. Despite their devastating potential, there is a general underestimation of the significance of BW compared to their nuclear and chemical counterparts. This oversight might largely be attributed to the limited use of biological agents in contemporary warfare and terrorist activities, which paradoxically reduces their visibility in public discourse and media coverage.

The underestimation of biological threats, combined with the underwhelming media presence and the minimal emphasis on educational programs addressing BW, propels this study. It aims to delve into the multifaceted perceptions of BW among the Czech public, identify the prevalent gaps in knowledge and preparedness, and foster a dialogue that could lead to better-informed public policies and stronger defensive measures against biological hazards.

This study specifically tests two hypotheses: H1, that people under 30 consider the use of biological weapons as a current topic less often than those over 30, and H2, that men are more likely to know how to act in the event of a biological attack than women. Examination of these aspects sets the stage for a comprehensive analysis of the role of BW in contemporary security environments and emphasizes the need for a holistic strategy towards enhancing public enlightenment and national readiness against the threats posed by biological agents.

2. Technical overview of BW

Biological weapons are distinct from other types of weaponry due to their diversity. Various agents can be exploited as BW, each differing significantly in terms of their effects. These differences include factors such as infectivity, incubation periods, environmental survivability, the dosage required for successful infection, and the severity and progression of the resulting illness, including potential lethality. Viral diseases pose the greatest challenge in treatment as they cannot be treated with antibiotics and antivirals are only limitedly effective. Additionally, viruses continually evolve, often undergoing frequent mutations during replication [1].

Globally, numerous pathogenic organisms can cause or transmit diseases, all of which could potentially be weaponized under certain conditions. Key criteria that determine whether a pathogen is suitable for use as a biological agent include its resilience in external environments, its ability to spread, stability, toxicity, potential lethality, ease of storage, and the costs and accessibility associated with its production [2].

These criteria are significant when selecting pathogens for use by terrorist groups. According to Table 1, the production costs of biological agents are negligible compared to chemical weapons, yet they can still achieve a significant destructive impact, earning them the nickname “the poor man’s weapon”. See Table 1 for a comparison [3].

The most critical component of a biological weapon is the pathogen itself, exclusively used in combat and categorized as a WMDs the term “biowarfare” (BWA) is commonly used internationally. Misuse of biological agents is prohibited by the 1975 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and their Destruction, classifying them as a specific type of combat weapon among WMDs [4]. For a more detailed description, see Table 2, which tracks the Application possibilities of biological agents [2].

Table 1.

Comparison of basic characteristics of chemical and BW [3]

Characteristic	Chemical Weapons	Biological Weapons
Area	<10 km^2	100-1000 km^2
Coverage/km^2	500-1000 kg	1-5 kg
Cost/km^2	600 USD	1 USD
Duration of effect	Minutes (nerve agents) to hours	Hours (toxins) to weeks (Q-fever)
Form	Gas or liquid	Solid

3. The various categories of biological agents according to the CDC classification

The Center for Disease Control and Prevention (CDC) has categorized biological agents into three distinct groups based on the risk they pose to the general population and national security of the United States:

1) Category A: These pathogens are easily transmissible from person to person. Their deployment can lead to high mortality rates and rapid spread through the population, requiring intensive control measures which may not always be effective. Societal disruption is expected as social structures become compromised. Examples include Bacillus anthracis, which causes anthrax; Clostridium botulinum, the agent of botulism; and Yersinia pestis, responsible for the plague.
2) Category B: Compared to Category A, these pathogens spread less efficiently and are associated with lower mortality rates. Nonetheless, significant efforts are necessary to manage potential outbreaks. This category includes Coxiella burnetti, causing Q fever; Brucella spp., responsible for brucellosis; Burkholderia mallei, the agent of glanders; Ricinus communis, known for ricin intoxication.

3) Category C: This category comprises emerging pathogens that are considered a high priority due to their potential for mass exploitation in the future, facilitated by their accessibility and ease of production. High mortality and morbidity rates are anticipated with these agents. Notable examples are the Nipah virus and Hantavirus [5].

Table 2.

Application possibilities of biological agents [2]

Application possibilities	B-agens as a Biological Weapon	B-agens as a Means of Terrorism	B-agens as an Imported Infection
Primary Objectives of Impact	Destruction of the enemy's living force through lethal or incapacitating means	Inducing fear and uncertainty, possibly causing the deaths of high-profile individuals	Accidental, but possible introduction into the general population
Target Group	Military	Civilian population	Civilian population
Who Protects Against Attack	Special military units	Civil state security and health institutions	Civil institutions
Duration of Impact	Short-term effect, short incubation period leading to rapid death, epidemic spread	Long-term effect, relatively long incubation period, limited spread	Mostly short-term effect and limited spread

4. BW and B-agens from the perspective of national and international policy

The Biological and Toxin Weapons Convention (BTWC) is a key international document in the field of BW protection. It was the first multilateral treaty to categorically ban a class of weapons. The treaty prohibits the development, accumulation, production, or transfer of biological materials and toxins in types and quantities that have no justification for protective or peaceful use. It also prohibits the development of weapons, equipment, or delivery systems for the dissemination of such substances or toxins. If a state owns any such substance, toxin, or delivery system, it has nine months from the entry into force of the treaty to destroy its stocks or divert them for peaceful use. All details are described in 25 individual articles of the Convention. The Convention was signed on April 10, 1972, in Moscow, London, and Washington. After ratification, it entered into force on March 26, 1975. For interest, I am also including two current images that illustrate the historical development and use of biological weapons (Figure 1), as well as the current state of biological weapon activities as of 2022 (Figure 2) [6].

The Convention stipulates that states will cooperate bilaterally or multilaterally in addressing compliance issues. States may also submit complaints to the UN Security Council resolution if they believe another state is violating the treaty. However, there is no BTWC enforcement body that would allow sanctioning for apparent violations, as was the case in the past. Every five years, a review conference is held to review the implementation of the convention and to establish confidence-building measures [7].

As the Czech Republic is a signatory to the Convention on the Prohibition of BW, it is obliged to fulfil the duties related to it. The Convention is thus a key document that has also been reflected in our valid legislation. The Convention was signed by the then Czechoslovak Socialist Republic on April 10, 1972, and ratified on April 30, 1973. The Czechoslovak Socialist Republic issued it in the Collection of Laws as Decree of the Minister of Foreign Affairs No. 96/1975 Coll. After the dissolution of Czechoslovakia, two separate states were created. The effective date of succession by the CR is January 1, 1993.

The CR is one of the current 185 treaty states that have decided to incorporate the obligations set by the Convention into their legal system. The central norm relating to the Convention is Act No. 281/2002 Coll., on Certain Measures Related to the Prohibition of Bacteriological (Biological) and Toxin Weapons and on Amending the Trade Licensing Act, as amended. The CR has been a strong advocate of non-proliferation, disarmament, and arms control policies since its independence. Since 2004, when the CR joined the European Union, it has been guided by the policy of the European Union in these matters.

The CR is also among the treaty states that have incorporated the obligations set by the Convention into their legal system. The central norm relating to the Convention is Act No. 281/2002 Coll. on Certain Measures Related to the Prohibition of Biological and Toxin Weapons and on Amending the Trade Licensing Act, as amended. Based on this, the State Office for Nuclear Safety (SÚJB) has been the national authority for fulfilling the Convention since 2002 [8].

Fig. 1. Historical BW activity [8].

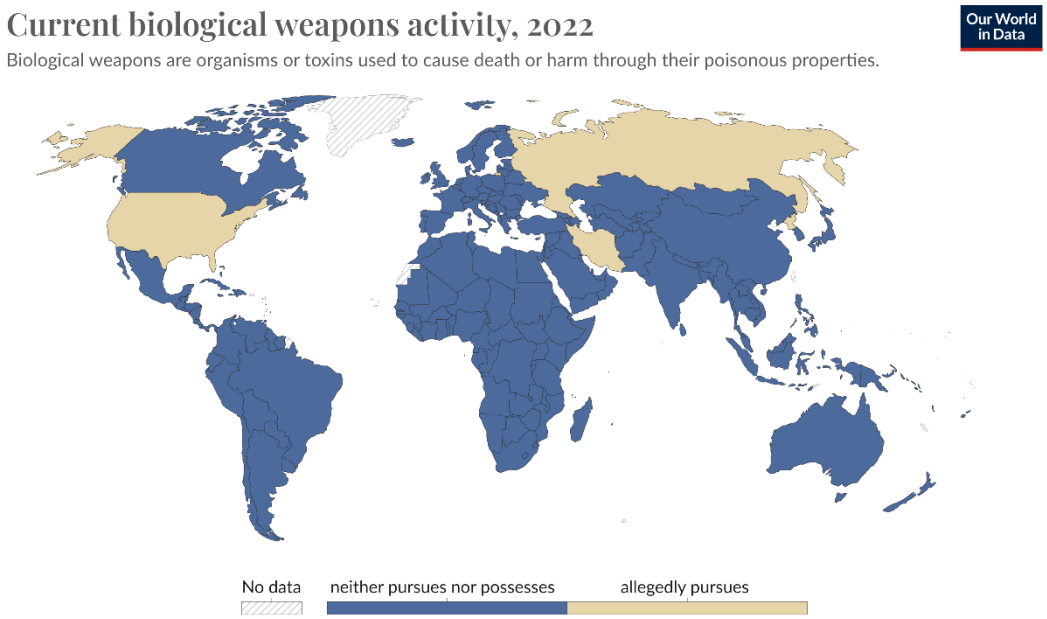

Fig. 2. Current BW activity [8].

5. Description of the research investigation

A thorough examination of existing Czech and international academic literature on BW was undertaken as part of the theoretical groundwork. The objective was to summarize essential insights on BW by utilizing pertinent data from online databases and current legal frameworks. This comprehensive approach facilitated a detailed exploration of the fundamental attributes and obstacles linked with BW within scholarly discourse. In the empirical phase, a quantitative research methodology was adopted, employing a survey questionnaire to gauge public sentiment on BW matters in the CR. The survey was administered in 2022. Distribution was carried out through direct web links and across diverse demographic segments via social media and email channels. The survey was conducted anonymously using a web application. Data analysis was conducted using R software, employing contingency tables to compare categorical variables. Hypothesis testing utilized the $\chi 2$ independence test to ascertain the presence or absence of relationships between observed variables. The study encompassed 301 respondents, constituting a representative sample of the general populace, aimed at illuminating their perspectives and stances regarding BW.

6. Discussion of results

In the framework of the survey, 27 distinct questions were formulated. However, for the purposes of the article, we have elected not to include all the findings but to focus more closely on those that we subjectively perceive as the most significant or those that most distinctly delineate the status of BW within the CR as well as their perception from the perspective of the civilian population.

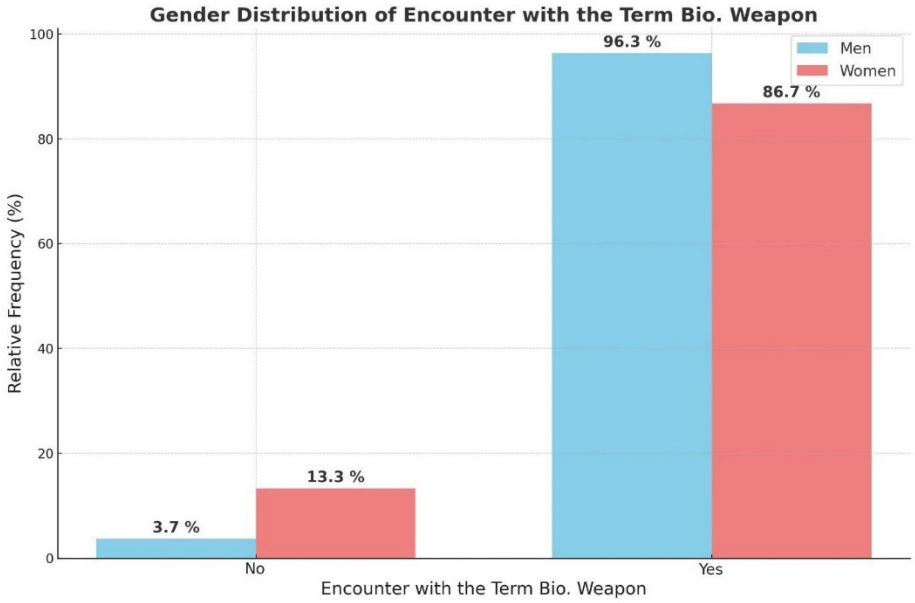

Fig. 3. Encounter with the term "Biological Weapon" in relation to the gender of respondents [source: own].

Majority participants recognized the term “biological weapon”, with men slightly exceeding women in awareness, see Figure 3. An open-ended question sought their interpretation of the term, which was complex due to subjective responses without strict right or wrong criteria. Responses, categorized broadly, showed that 218 participants (72.4%) aligned with the accurate definition, referencing pathogen-based weapons for mass destruction. Another category had 64 responses (21.3%) showing a disconnect, while 19 (6.3%) confused biological with chemical or nuclear weapons. Thus, 91% knew the term, with 72.4% correctly articulating its meaning.

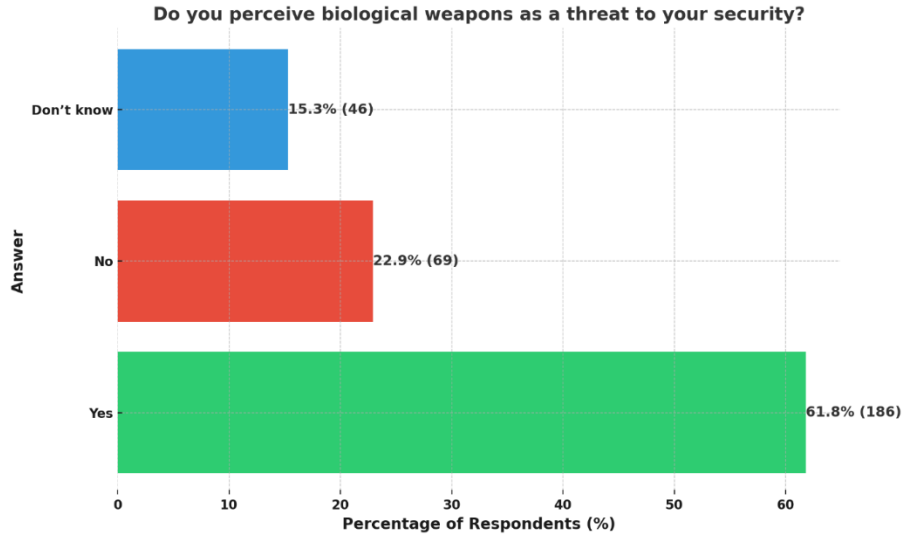

Fig. 4. Results from the question investigating whether respondents perceive a biological weapon as a threat to their security [source: own].

In the survey component assessing the perception of BW as a threat to personal security, a clear majority of respondents (61.8%) affirmed such concerns, see Figure 4. Considering the inclusion of BW within the category of WMDs one might subjectively expect a somewhat higher percentage aligning with this viewpoint. The observed response rate can be attributed to several factors. The likelihood of a BW attack on our territory is relatively low compared to other countries, partly due to the low probability of a terrorist act (bioterrorism is currently deemed most likely—refer to previous

discussions), and the risk of a biological war occurring within our borders is also minimal. Media coverage does not allocate sufficient attention to the issue of BW (a finding that was also reflected in public opinion on one of the survey questions), leading to its marginalization in societal discourse. As a result, people may not perceive BW as an immediate threat in most cases, but rather only in a slightly more than half of the instances.

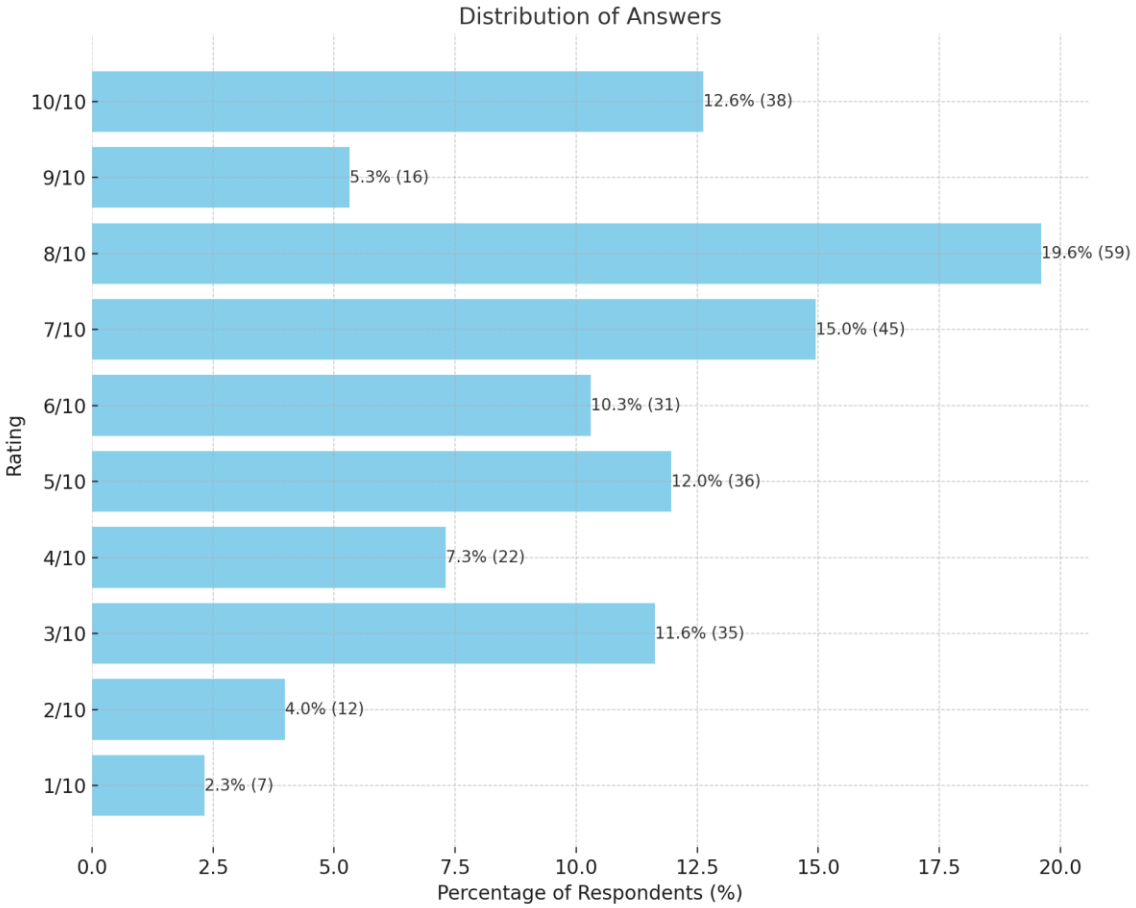

Fig. 5. Perception of the current relevance of BW on a scale of 1-10 [source: own].

The survey gauged the perceived relevance of BW on a scale from 1 to 10, where 1 denoted 'not relevant' and 10 denoted 'highly relevant', ss shown in the Figure 5. This parameter was instrumental in substantiating the study's conclusive evaluation. The distribution of responses did not show any option exceeding a 20% share, with a relatively even spread across all ten points on the scale. The option rated 8/10 emerged as the most represented, with 59 responses (19.6%), while the least represented was the option rated 1/10, with 7 responses (2.3%). Due to the evaluative complexities, the data were aggregated into three final categories:

- 1-3 for 'Not Relevant',
- 4-7 for 'Relevant',
- 8-10 for 'Highly Relevant'.

An arithmetic mean of 6.3 placed the consensus within the 'Relevant' category. Considering the timing of the survey, amidst the backdrop of the Ukrainian conflict, it was subjectively expected that respondents would rank the issue as 'Relevant' to 'Highly Relevant.' Although the average score of 6.3 is somewhat reassuring, it prompts further inquiry as to whether it ought to have been higher, especially considering an escalating European conflict with the potential to extend beyond borders, wherein weapons of mass destruction, including BW, might be employed.

Mass media are the dominant source of information in today's world, and it would be remiss not to consider whether they allocate adequate attention to BW as part of the broader category of weapons of mass destruction. Most survey participants selected 'no', with a total of 211 responses (70.1%), indicating that the subject of BW is not given much space. The 'yes' and 'don't know' options had very similar statistics—14.3% and 15.6%, respectively. These results, as shown in Figure 6, suggest that most people feel that the topic of biological weapons does not receive an ample coverage.

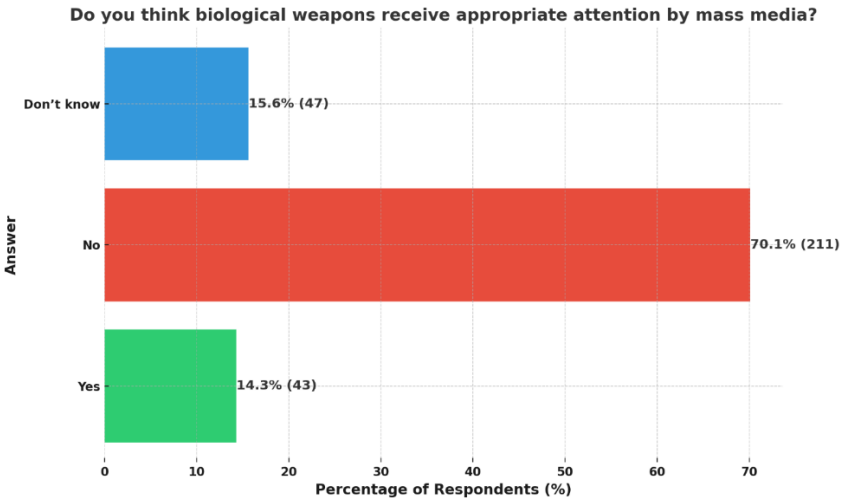

Fig. 6. Perception of media activities regarding the topic of BW [source: own].

The outcome could have been partially influenced by the ongoing war conflict, yet still, 70% of respondents leaned towards 'no'. Here we see a fundamental issue where this topic has been consistently neglected by mass media, resulting in a general lack of basic awareness regarding BW, such as protection against them. Due to the lack of media interest, it's challenging to obtain even rudimentary information on BW. This subject is not directly encountered in educational curriculums at the elementary or secondary school level. There is no unified online platform that comprehensively educates readers about BW in a digestible manner. Although there are several verified online sources, they primarily serve those who have a personal interest in seeking information on the topic. Therefore, an impartial citizen rarely comes across a consolidated overview of information, even though our survey indicated that over 91% of respondents have encountered the term 'BW' in some form in their lives.

Given the dynamic developments in the world and the current geopolitical climate, where conflicts rage in various regions and terrorist organizations are active, the deployment of BW cannot be entirely ruled out, despite the near-global restriction on their development and use under the BTWC. Also noteworthy is the technological advancement that could potentially facilitate the easy and inexpensive cultivation of dangerous pathogens for warfare purposes. These facts alone raise the question of whether future generations will need to pay closer attention to the issues surrounding the use of BW. The finding that 232 respondents, accounting for 77.1% of the total, view the relevance of BW as likely to increase over time is quite compelling. Thus, it can be asserted that participants generally believe the issue of BW use will gain progressively more relevance as time goes on.

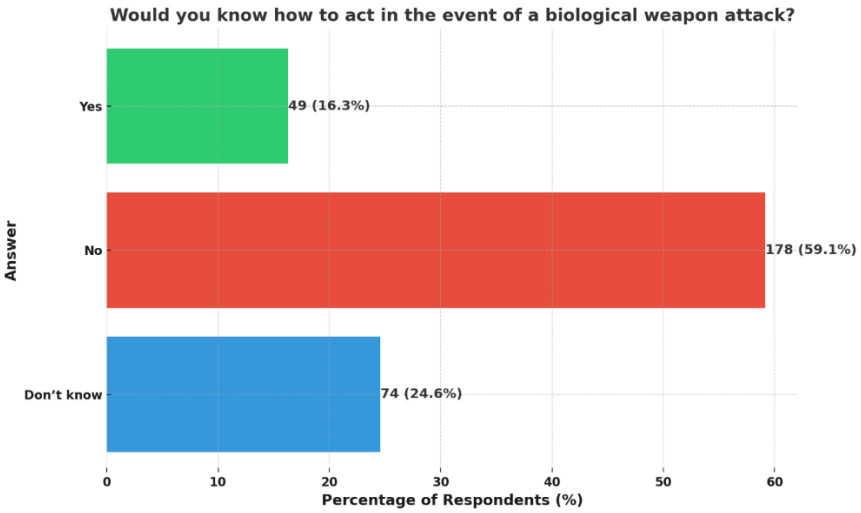

Fig. 7. Awareness of how to act in the event of a BW attack [source: own].

The survey results concerning preparedness for a BW attack brought somewhat troubling, albeit expected insights. Only 16.3% of respondents indicated that they would know how to react in the event of a BW attack, see Figure 7. This is considered a critical piece of information, as knowledge of basic protective measures, whether professional or improvised, is essential for survival in the event of a biological weapon deployment, a laboratory leak, or any other related emergency among the civilian population. Addressing this deficiency should be a target for remediation in the coming years. For the sake of interest, we also present the ratio of responses across genders. While 27.9% of men would know how to respond in the event of a BW

attack, only 6.7% of women would likewise be able to act adequately. We did not investigate the cause of this disparity further, so we can only estimate the various factors that might influence it.

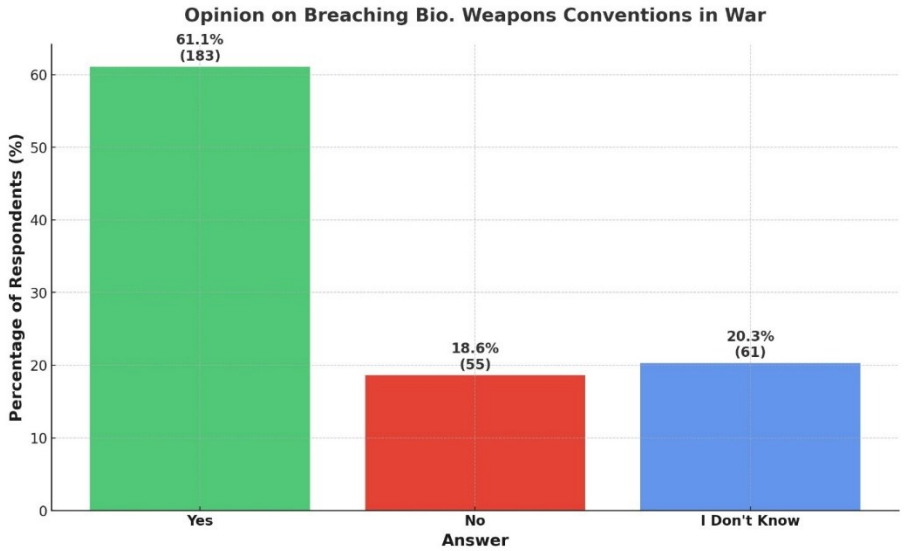

Fig. 8. Public trust in international conventions in case of war conflict [source: own].

We presented respondents with a simplified statement based on Cicero's quote, "In war, law falls silent": in the event of a wartime conflict, valid conventions and international treaties would be breached to gain an advantage over the enemy. As can be seen in Figure 8, we sought to assess how much the respondents agreed or disagreed with this proposition. Despite the existence of legal frameworks like the BTWC, 61% of respondents believed that such conventions would be widely violated to secure advantages, a perspective that reflects deep-seated skepticism about the effectiveness and significance of international agreements during significant military and humanitarian crises affecting Europe—the most extensive since World War II. This finding underscores the serious concerns about the actual effectiveness of such international treaties and raises questions about the real weight of legal documents in times of crisis.

7. Evaluation of the research hypothesis

Two research hypotheses were formulated as part of the research investigation. Their evaluation is presented below.

H1: People under 30 consider the use of BW as a current topic less often than those over 30.

When conducting a chi-square test of independence, the p-value came out to $0.737 > 0.05$ – there is no significant relationship between age and responses and further testing in the test set does not proceed. No statistically significant correlation was demonstrated between age and perception of the topic's currency. The hypothesis was not confirmed.

H2: Men are more likely to know how to act in the event of a biological attack than women.

To verify the second hypothesis, data from Question 20 were used. As illustrated in Figure 9, only 27.9% of men would know how to act in the event of a biological weapon attack. This result suggests an alternative hypothesis, which I have chosen for these purposes: “Men are more likely to know how to act in the event of a biological attack than women." For a definitive answer to this hypothesis, it is necessary to focus on the subset of respondents who did not select the "I don't know" option—those who indicated they would know how to act and those who indicated they would not know how to act in the event of a biological weapon attack. We then conducted a chi-square test of independence on these responses based on the respondents' gender. The resulting p-value was <0.001, indicating the rejection of the null hypothesis (that the gender of the respondents does not influence whether they would know how to act in the event of a biological weapon attack).

As shown in Figure 10, men are indeed more likely to know how to act than women, and this difference is significant given the test results. Therefore, the alternative hypothesis ("men are more likely to know how to act in the event of a biological weapon attack") cannot be rejected. It is also important to mention that, to minimize undesired high variability in the results caused by the small group of respondents who answered "yes," the data were not pre-split into testing and training sets. For better visualization of the results, the complete dataset was tested together.

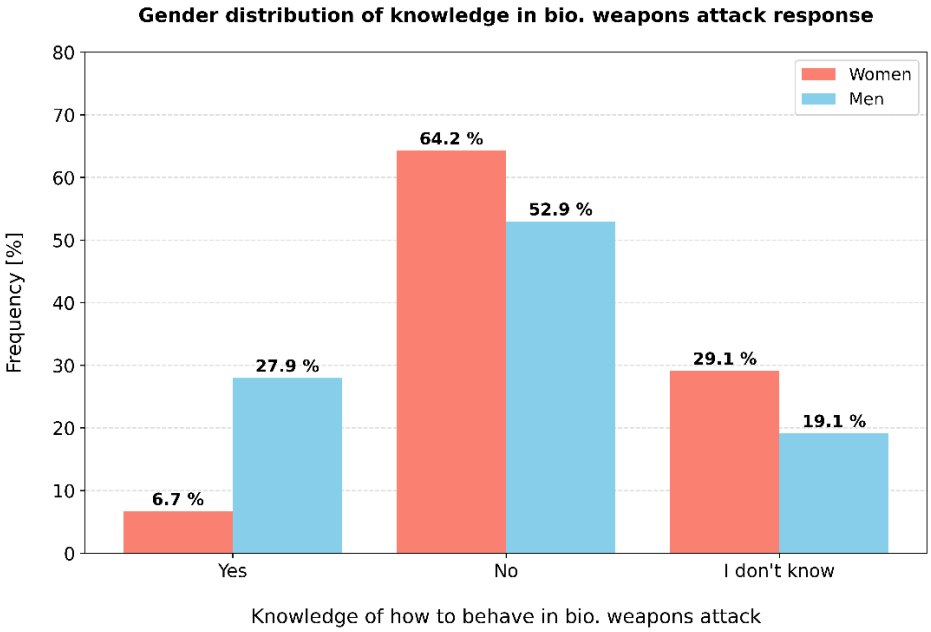

Fig. 9. Results from the second confirmed hypothesis [source: own].

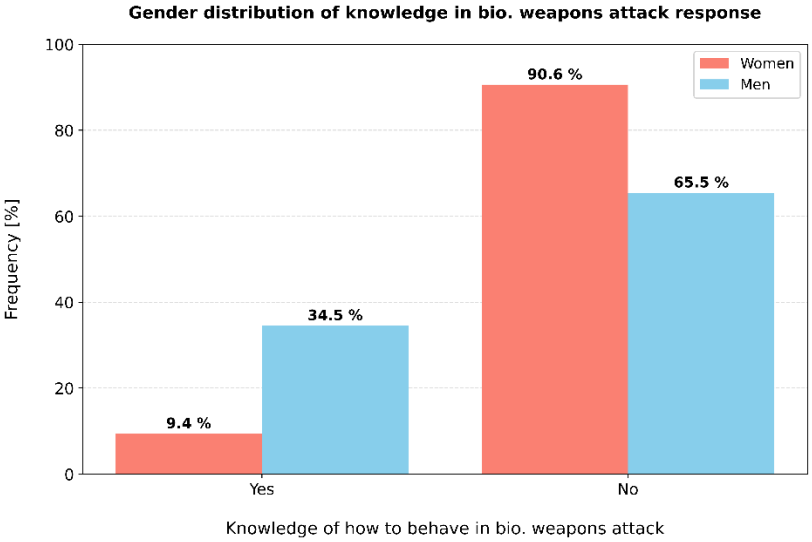

Fig. 10. Results from the second confirmed hypothesis [source: own].

8. Conclusions

Based on the obtained results, the implementation of extensive awareness programs and educational initiatives is recommended to inform the public about the risks [9,10], prevention, and protective measures associated with BW. It is imperative to enhance media coverage of the BW topic, support the integration of relevant information into school curricula, and develop targeted media campaigns aimed at expanding public awareness. Furthermore, strengthening international cooperation and transparency within control mechanisms is proposed to increase public trust in the effectiveness of international agreements. The creation of a unified online platform providing access to verified information and resources on BW could significantly contribute to demystifying the topic and increasing public awareness. Additionally, it is crucial to incorporate this issue into awareness and educational programs within the broader context of weapons of mass destruction. This approach can significantly contribute to overall public awareness of risks and protective strategies in the current security situation.

Similar conclusions were reached by authors Nenadic and Teodorovic (2020)., whose study focused on the understanding and perception of bioterrorism among the public in Serbia. The results demonstrated an overall poor comprehension of bioterrorism and a significant lack of distinction between bioterrorism and infectious agents in general. The study highlighted substantial mistrust in government institutions and news media, suggesting that these factors should be considered when designing prevention and preparedness strategies as well as interventions through knowledge communication [11].

Conversely, Sterling et al. (2005) examined healthcare professionals in industrial settings, emphasizing that industry health professionals are well-positioned for early recognition, surveillance, and isolation of bioterrorism-related incidents. Despite heightened awareness of bioterrorism risks following the September 11, 2001, attacks, there remained a significant lack of local preparedness. Sterling et al. underscored the necessity of targeted education to improve the ability of these professionals to respond to bioterrorism threats effectively [12].

Pollard (2003) analysed data from national surveys conducted before and after the anthrax bioterrorist attacks in the fall of 2001. Their findings underscored the importance of local television, radio, and national health officials as trusted sources of information during bioterrorist incidents. This insight is crucial for effective communication planning during such events [13].

Shadel et al. (2003) conducted a national needs assessment of infection control practitioners (ICPs) in the United States between October 2000 and August 2001. Their study revealed significant regional differences in the perceived threat of bioterrorism and showed that only half of the respondents had prior training in bioterrorism preparedness. The study highlighted the urgent need for more resources and opportunities for clinical education in this area to provide continuing education credit. Shadel et al. recommended various instructional designs and media delivery methods to meet ICPs' educational preferences and needs [14].

In summary, the comparison of various studies indicates that awareness and preparedness for biological weapons and bioterrorism are generally insufficient across different regions and among different groups of healthcare professionals and the public. A common theme among these studies is the need to enhance education and training in this area, underscoring the importance of implementing extensive awareness programs and educational initiatives as recommended by the results of this study. This approach can significantly contribute to increasing overall public awareness of risks and protective strategies in the current security situation. Additionally, future research should focus on incorporating more objective measures of knowledge and awareness to address the limitations of subjective self-reported data used in this study.

References

1. **Středa L**., Proliferation of Weapons of Mass Destruction - A Serious Threat in the 21st Century. (in Czech), Praha: Ministerstvo vnitra - generální ředitelství Hasičského záchranného sboru ČR, 2003.
2. **Prymula R**., Biological and Chemical Terrorism: Information for Everyone. (in Czech), Praha: Grada, 2002.
3. **Fusek J**., Biological, Chemical, and Nuclear Terrorism. (in Czech), Hradec Králové: Vojenská lékařská akademie J.E. Purkyně, 2003.
4. **Matoušek J., Benedík J., and Linhart P**., CBRN: BW. (in Czech), Ostrava: Sdružení požárního a bezpečnostního inženýrství, 2007.
5. **Klement C., Mazencev R., and Bajgar J**., Biological and Chemical Weapons: Preparedness and Response. (in Slovak), Banská Bystrica: PRO, 2013.
6. **B. Herre and M. Roser**, "Biological and Chemical Weapons," Our World in Data, 2022. [Online]. Available: https://ourworldindata.org/biological-and-chemical-weapons. (accessed on April 15, 2024).
7. N. T. Initiative, "BW Convention," 2024. [Online]. Available: https://www.nti.org/education-center/treaties-and-regimes/convention-prohibition-development-production-and-stockpiling-bacteriological-biological-and-toxin-weapons-btwc/. (accessed on April 13, 2024).
8. Státní úřad pro jadernou bezpečnost, "BW Convention." (in Czech), 2022. [Online]. Available: https://www.sujb.cz/zakaz-biologickych-zbrani/umluva-o-zakazu-biologickych-zbrani. (accessed on April 15, 2024).
9. **R. U. Nenadić and S. Teodorović**, "Public Understanding, Perceptions, and Information Sources about Bioterrorism: Pilot Study from the Republic of Serbia," Health Security, vol. 18, pp. 29-35, February 2020.
10. **D. Sterling, B. Clements, T. Rebmann, S. Brooke, L. S. Stewart, R. Thomas, and R. Evans**, "Occupational physician perceptions of bioterrorism," International Journal of Hygiene and Environmental Health, vol. 2, pp. 127-134, January 2005.
11. **Tušer, I. A Hošková-Mayerová, Š.** Emergency Management in Resolving an Emergency Situation. Journal of Risk and Financial Management, 2020, 13(11), 262 p. DOI: 10.3390/jrfm13110262.
12. **Tušer, I., Jánský, J., Petráš, A.** Assessment of Military Preparedness for Naturogenic Threat: the COVID-19 Pandemic in the Czech Republic. HELIYON 2021, 7(4). DOI: 10.1016/j.heliyon. 2021.e06817.
13. **B. Shadel, T. Rebmann, B. Clements, J. Chen, and R. Evans**, "Infection control practitioners' perceptions and educational needs regarding bioterrorism: Results from a national needs assessment survey," American Journal of Infection Control, pp. 129-134, May 2003.
14. **W. Pollard**, "Public perceptions of information sources concerning bioterrorism before and after anthrax attacks: An analysis of national survey data," Journal of Health Communication, vol. 8, pp. 93-103, June 2003.