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Popular Article

Bioweapons: The Peril of Intentional Zoonotic Disease Releases

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Introduction

Biological warfare has changed throughout history from cavalry, chariots, swords, daggers, and arrows to more contemporary technologies like ammo, tanks, and missiles. Bioweapons are being employed more frequently now than ever before. Bioterrorism is the employment of bacteria, viruses, infectious agents, or biological products to hurt people, animals, plants, or any other living thing to sway political outcomes or intimidate civilian populations. Zoonotic diseases provide serious risks to both national and international security. They could cause widespread illness and death and have negative economic and social repercussions if they are intentionally or accidentally unleashed into populations.

To prevent the deliberate transmission of zoonotic illnesses as a bioterrorism weapon, a concerted multinational effort is required. Increased biosecurity measures, better biological threat detection and monitoring, and greater readiness and response capabilities should all be part of this endeavor. It's crucial to first know the nature of the diseases themselves in order to interpret the hazard posed by the intentional release of zoonotic diseases. Due to their ease of transmission and potential for human and animal mortality, zoonotic illnesses are appealing candidates for use as bioweapons. They may also impede social and commercial operations.

Historical Overview of Biological Weapons

Since the ancient and Middle Ages, several attempts to utilize zoonotic diseases as biological weapons during conflicts have been made. The use of poison dart frogs, tainted arrows, and water well pollution are all these approaches. Poisoning water wells was first done by the Holy Roman Emperor 1911

Barbarossa in 1155, however the technique of using poisoned spears and arrows dates to 400 BC. Because biological weapons were utilized during the siege of Caffa in 1346, more than 24 million people died. Other instances include the French and Indian War between 1754 and 1763, when the French drank wine mixed with leprosy patient blood in Naples, and the Polish who shot rabid dog saliva at their adversaries. Anthrax, cholera, and plague were used by Japan against Chinese soldiers and citizens during World War II. Biological weapons were developed during both World Wars I and II. Though there is no proof that biological weapons were ever used during the Cold War, the United States, and the Soviet Union both accumulated biological weapons.

Some of the deadliest pandemics in recorded human history, such as the Black Death and the Plague of Athens (430 BC), were driven on by zoonotic disease (1347-1351). Millions of Native Americans perished because of the European colonizers' introduction of smallpox. Central African chimpanzees are the source of HIV/AIDS, which spread to humans through animal diet and hunting. The SARS-CoV-2 virus, which is the source of the COVID-19 pandemic, first infected bats before moving on to infect people.

Zoonotic Diseases and Their Potential as Biological Weapons

Public health is at risk from zoonoses, which also have the potential to be utilized as biological weapons. They are diseases brought on by germs that humans and animals can contract from one another. They can disseminate via direct or indirect contact, vector-borne transmission, aerial transmission, and food-borne transmission, among other methods. Mosquitoes transmit infections from animals to people by vector-borne transmission, whereas airborne transmission involves inhalation of pathogens or contact with airborne particles. Food or water contamination can lead to foodborne transmission, which can be exploited to intimidate civilian populations during hostilities or for other illicit economic, political, or ethical motives. Furthermore, as zoonotic diseases are frequently linked to animal populations, it is difficult to stop epidemics in the environment. Worldwide known to animal husbandry may be essential to apply steps to stop the spread of zoonotic diseases as biological weapons, in regions with minimal veterinarian and medical care. As biotechnology has advanced, it has become simpler to modify and weaponize microbes, raising awareness of this possible threat.

Preventing Deliberate Release of Zoonotic Diseases

Global health security depends on preventing the intentional release of zoonotic diseases. Through legislative frameworks, international treaties, and attempts to promote transparency in public, organizations and governments play a crucial role in preventing the creation and use of biological weapons. The WHO is in organizing international efforts to stop the spread of infectious diseases, especially zoonotic diseases that could be turned into biological weapons. The WHO encourages laboratories to use biosafety and biosecurity precautions, and it offers countries technical support for

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it. The UN Security Council is tasked with stopping the creation and use of all types of mass destruction weapons, including biological weapons.

National governments are in creating national rules and regulations for biosafety and biosecurity in laboratories, putting into effect international treaties and agreements related to the prevention of biological weapons, and enforcing sanctions against people or nations that disobey these rules. Additionally, governments are required to contribute money to the study of zoonotic illnesses, other potential biological weapons agents, and the creation of novel diagnostic techniques and therapies. The Biological Weapons Convention (BWC), the National Select Agent Program (NSAP), the Laboratory Biosafety Guidelines, national laws, institutional biosafety committees (IBCs), export restrictions, and criminal penalties are some of the major legislations and government regulations governing the handling of biological agents. By implementing these measures, countries can work towards preventing the accidental release of dangerous pathogens and the intentional use of biological weapons.

International frameworks and agreements for preventing biological weapons:

Recognition of the potentially catastrophic effects of their misuse or uncontrolled spread has influenced the evolution of worldwide efforts to manage zoonotic pathogens and biological weapons. Important developments include the Geneva Protocol (1925), the Biological Weapons Convention (1972), the Chemical Weapons Convention (CWC), the Biological Weapons Convention Review Conferences (1980-2016), the UN Security Council Resolution 1540 (2004), the Global Health Security Agenda (2014), the Australia Group (1985), the International Health Regulations (1969), the Global Outbreak Alert and Response Network (2000), One Health (2004), and the Pandemic Influenza Preparedness (PIP). By promoting international cooperation and response in the case of a biological weapons strike, these advancements hope to foster confidence between nations, protect public and environmental safety, and enhance state trust. The Global Health Security Agenda (GHTSA) also seeks to improve zoonotic disease response and surveillance, with numerous nations creating their own national action plans to deal with this issue.

Conclusion

The essential task of preventing and responding to intentional releases of zoonotic diseases needs for continual development and adaptation. Future paths should focus on expanding international bio surveillance networks, funding for innovative technology, enhancing teamwork, fostering transparency, bolstering health systems, addressing root problems, and raising public awareness and education. Zoonotic agents pose a serious threat to human populations, and biotechnology breakthroughs make it simpler to modify or develop treatment resistance in them. For preventing intentional releases and effectively responding, a multifaceted strategy that includes animal population monitoring, stringent laboratory research regulations, and international cooperation is needed. The



threat of pandemics brought on by zoonotic diseases must be addressed globally, which calls for increased international cooperation and funding for prevention and response actions.

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