World Health Organization (WHO)

Preventing bioterrorism and the misuse of medical innovations in global health crises

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Introduction:

In 2025, innovations around medicine are causing continuous breakthroughs in global healthcare. Unfortunately, medical innovation is not exclusively used for the sake of global health goals. A global health crisis does not only show the world how humankind can come up with innovations tackling health issues but also leaves room for exposing vulnerabilities in the global health systems.

With advancements come risks. For example, when biotechnology advances, so does the creation, management and use of bioweapons. When a bioweapon is used, it can result in sickness being spread to living things, while bringing fear and/or panic with it in the process. Intentional use of bioweapons is a serious issue, referred to as bioterrorism. The capability to manage these attacks is not guaranteed all around the world. Especially Less Developed Countries (LDCs) tend to not have the tools to take measures in preventing or acting on bioterrorism. The preventing of and capability to manage these attacks all around the world is crucial to protect every community against health threats. The rapid and groundbreaking medical advancements in global health crises, although very crucial, also contribute to bioterrorism, calling for measures preventing bioterrorism to evolve with the new medical innovations.

In addition, misuse or ineffective use of medical innovation stands in the way of global health. The accelerating developments in global health crises can go quicker than regulatory safeguards or joint efforts, with the possible emergence of global inequality during crises as the outcome. Not only could this strike communities in LDCs immensely, but it also impedes the overall global conditions, since viruses get the chance to develop, spread and cause harm. In a worldwide crises, worldwide measures and efforts are needed to resolve the issue. Misuse of medical innovation impact people on a global scale, seeing as people are left behind without life-saving resources or protective measures for communities.

Moreover, things like the misuse of medical innovation do not only touch public health, but it can also touch public stability. Lack of transparency, proper safeguards and/or safety regulations create mistrust in the population around medical research and advice. More people would feel hesitant to accept fitting measures, like vaccines or other treatments. Another risk is the spreading of

misinformation and escalated speculations. This misinformation and speculation could spread and further feed mistrust or fear.

In conclusion, preventing political instability, panic, public mistrust in medical innovation, and risks to global health traces to back to preventing the misuse of medical innovation and bioterrorism in global health crises.

Definition of key terms:

Global health crisis

A global health crisis is a situation in which there is a danger to people's health on a global scale. It is widespread, meaning the crisis impacts communities in different countries, not just in a small region or on national scale. It often overloads healthcare systems. Such a crisis can escalate quickly, calling for multilateral measures. Examples of global health crises are the covid-19 pandemic, the AIDS pandemic and cholera outbreaks.

Bioweapons

Biological and toxin weapons are either microorganisms like virus, bacteria or fungi, or toxic substances produced by living organisms that are produced and released deliberately to cause disease and death in humans, animals or plants (World Health Organization).

Bioterrorism

When bioweapons are used for an any attack with political motives, this is considered bioterrorism. Bioterrorism hurts or kills humans, animals and/or plants with the motive of intimidating a population or government. These attacks are hard to recognize, since the consequences of a bioterrorism attack may seem like a natural event. The results of an attack like this can have great impact, for example in the form of overloading healthcare systems, creating chaos or panic and disrupting an economy.

Medical innovation

Medical or healthcare innovation is the development of new techniques that aim to improve healthcare. Think of new methods to creating or introducing medicine or vaccines, or the development of AI models to help recognize disease. In global health crises, medical innovation is crucial.

Less Developed Countries (LDCs)

Less Developed Countries are countries with relatively low socio-economic growth. They face not only economic challenges but also have limited access to new tech and thus are very vulnerable to

economic shocks, poverty and lack of infrastructure. Moreover, LDCs often have weak healthcare systems, limited access to medical innovation and rely on support from organizations or other countries.

More Developed Countries (MDCs)

Dissimilar to LDCs, More Developed Countries are more advanced in fields of economy, education, technology, governance and healthcare. They have higher quality of life and are heavily industrialized.

General Overview:

The intentional use of biological agents to spread disease is by no means new. Biological warfare can be traced back to as early as the 14th century, occurring during the siege of Caffa. During the conflict, plague-infected bodies were catapulted into the ports of Caffa, believing to have started the plague pandemic in Europe. This case is one of the first recorded usages of biological agents for an attack, though certainly not the last. For example, it is theorized by historians that the Brits caused a health crisis by passing around infected blankets to the Native Americans during Pontiac's uprising in the 18th century.

In addition, bioweapons were frequently deployed during World War I. The horrific consequences of these events led to the signing of the Geneva Protocol in 1925, an international agreement to prohibit the use of bioweapons in conflict. Later on, in 1975, the Biological Weapons Convention (BWC) expanded the prohibitions, by banning the development, production and stockpiling of all bioweapons. In between theses agreements, the World Health Organization had already issued a report about the dangers of deploying biological warfare agents. However, these agreements have been disrespected in many ways since then, repurposing medical innovation for biological warfare.

Upsurging of bioterrorism

Weaponizing medical science is not only seen in warfare, but it has also found its place in terrorism attacks likewise. Non-state actors have been using biological agents for attacks, spreading disease as well as fear. In such a bioterrorism attack, biological agents are released for political motives. The largest bioterrorism attack in the United States was initiated by a cult wishing to disrupt local elections, resulting in an epidemic. A concerning part of this incident is that health departments were not able to conclude the origins of this epidemic, until the confession of a cult member, confirming the epidemic to be a result of a biological attack. It goes to show how incredibly hard it is to track down these attacks, thus complicating approach.

A possibly even more significant example of bioterrorism is the anthrax attacks in 2001. Letters laced with anthrax, a dangerous infectious disease, were spread by mail in the United States. As of today, viruses can easily be manipulated, created and turned into a weapon, because of the rapid innovations in microbiology. Bioterrorism can target civilian vulnerabilities and if not responded urgently and effectively, have greater international consequences.

The risks of bioterrorism are great, the threats of it happening nowadays even greater. Tech advancements such as synthetic biology, AI-designed toxins and many more are outpacing regulations.

In conclusion, while the opportunities concerning creating bioweapons and releasing them for political motives are evolving, the policies are falling behind.

Impact of misuse of medical innovation

An example of a recent global health crisis impacting a lot of lives is the covid-19 pandemic. Measures like quarantines were taken and after some difficult time, a vaccine was developed. The corona pandemic is an example that includes the lack of global collaboration to spread vaccine doses and certain communities being left behind, resulting in vaccine inequity.

The pandemic has shown many things. To start, how quickly a virus can destabilize the global health status. Then, the mismanagement of health tools in the covid-19 pandemic revealed a weak spot in the capability of securing global health. Overall, how misuse of medical innovation is a threat to global security. National or bilateral interests were put above the global distribution of vaccines. The unfair distribution does not only threaten the global health, it sends a message to the public that healthcare is not a universal right, but a wealth privilege.

The covid-19 pandemic exposed the ethical and political vulnerabilities in how medical innovation is governed and that the world is not prepared for the consequences. This is relevant to every single health emergency.

Disproportional capabilities

Especially LEDCs do not have the tools to act upon bioterrorism or have many influences on preventing attacks. These countries often have poor healthcare systems and rely on support from other nations. In global health crises, like it has shown before during the covid-19 pandemic, misuse or mismanagement of medical innovation such as vaccines or other advancements can impact LEDCs on great scale.

Though LEDCs are disproportionally unprepared, MEDCs are not always leveled in preventions or measures in relation to the possibilities and risks either. Global health must be protected by the

prevention of these attacks and capability to respond appropriately, wherever in the world it might occur. Bioterrorism and misuse of medical innovation remains a global concern.

Key Events Timeline

1346, One of the first recorded cases of biological warfare during siege of Caffa

1914-1918, Biological warfare during World War I

1925, Geneva protocol

1939-1945, Biological warfare during World War II

1975, Biological Weapons Convention (BWC)

1979, Anthrax leak from bioweapon facility in Russia

1984, Rajneeshee bioterror attack

2001, Anthrax letters in the United States

2020-2023, covid-19 pandemic

1961-now, Seventh cholera pandemic

2020-now, Rapid advances in gene editing and other biotechnology

Principal Stakeholders

European Union

The European Union is promoting research on pandemic preparedness and response. It is clear that the EU is already taking steps to preventing and responding to bioterrorism, while improving training and laboratory work improving the preparedness to bioweapons. This, in combination with other efforts, stresses the importance of tackling the issues. Though the biosecurity still differs from the member states of the EU and the concerns around bioterrorism and pandemic preparedness are not immediately solved, the efforts bring an example of action and challenge the world to prioritize the issue.

INTERPOL (International Criminal Police Organization)

The international organization of criminal police is expected to coordinate responses to all threats regarding bioweapons, since its role is to make the world a safer place by enabling police to work together all around the world. The organization has a Bioterrorism Prevention Unit, including training on how to prevent, prepare and respond to a bioterrorism attack. Moreover, the organization also has

biological response teams for epidemic outbreaks. This concerns natural outbreaks as well as results of attacks. INTERPOL has expertise and global reach, making the organization an actively involved party.

Russian Federation

Russia has an important geopolitical position along with an important position in the advancements in biotech and medical innovation. The Soviet Union (now Russian Federation) had a bioweapons program, violating the international agreements. The possible legacy of this program and the lack of transparency raise worries.

The People's Republic of China

China has publicly committed to prohibiting bioweapons by joining the BWC. The country can play a big role in resolving the issues around bioterrorism and misuse of innovation, since China proves to be advanced in biotechnology and medical innovation. However, China's role in international biosecurity has been scrutinized. In 2021, the World Health Organization wanted to research further on the origin of the covid-19 virus, but the organization was denied access to labs. Later on, with the UN organ stressing the importance of sharing data, China has gained some mistrust about transparency.

United States of America

Having fallen victim of multiple big bioterrorism attacks, the United States is serious about protecting biosafety and enhancing the prevention and response of these attacks. In addition, the US signed the BWC. After officially participating in the BWC, the USA switched the offensive measures to defensive measures. On the other hand, the BWC does not have verification methods, which the US denied with the proposal of such. This would be costly, but also invasive. Mistrust could be an issue while tackling international security concerns, because of secrecy and avoidance of verification, indicating the possibility of the US putting national security interests above the international commitments.

World Health Organization

In preventing bioterrorism and misuse of medical innovation, the World Health Organization is a crucial actor. It advises nations on global health security, alongside specific advice and information on

bioterrorism and medical innovations. The impact of the organization does depend, however, on the cooperation of member states and the dedication to the subject.

Potential Avenues for Resolution

As mentioned before, the BWC does not have a verification system, trusting the international community with their promise. Moreover, transparency seems to be a problem regarding this issue. However, the sovereignty of the individual nations is an important right to hold on to. Finding a way to develop a just and trust building way of verification seems like a good step, if even possible.

Response strategies, prevention strategies and safety measures around lab work vary from country to country. Some kind of international biosafety guidelines, like the EU is trying to set up within their member states could be an appropriate approach.

Global security is only as strong as the weakest link. Even if some MEDCs are developed in healthcare and thus able to respond and heal from misuse of medical innovation in any way, the LEDCs lack resources and are often hotspots during global health crises. Helping LEDCs in their studies, providing knowledge and training, with cooperation and overall providing support, could bring up the whole situation.

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