Cite Us

Citation: Janjua, T. Z., Fatima, N., & Saba, K. (2021). Challenges to Biosecurity: Improving Responses and Reducing Challenges. *Global Strategic & Security Studies Review, VI*(III), 19-26. https://doi.org/10.31703/gsssr.2021(VI-III).03

DOI: 10.31703/gsssr.2021(VI-III).03 **p- ISSN:** 2708-2121 **e-ISSN:** 2708-3616 **L- ISSN:** 2708-2121

Challenges to Biosecurity: Improving Responses and Reducing Challenges

Pages: 19 – 26 | **Vol.** VI, **No.** III (Summer 2021) | **URL:** http://dx.doi.org/10.31703/gsssr.2021(VI-III).03

Tayyaba Zaman Janjua * | Noor Fatima † | Kokab Saba‡

Abstract *The research explores the existing challenges to biosecurity due to competition among the great powers in the international system and hence focuses on how those challenges can be managed by increasing responses and reducing challenges at the state and global levels. The research hence focused on how the global community should respond so as to reduce challenges to biosecurity and hence suggests recommendations so as to mitigate the threats to biosecurity at the state and global level. This phenomenon of competition among great powers has generated many challenges to biosecurity. The vulnerabilities to the domain of biosecurity have much increased due to great powers competition. Hence in the COVID-19 outbreak, the Great power competition has lowered the measures of biosecurity and increased many threats to it.*

Key Words: Great Powers' Competition, Challenges to Biosecurity, COVID-19, Reducing Challenges

Introduction

The existing challenges to biosecurity due to competition among the great powers in the international system are focused on in this paper. Against this backdrop, it focuses on how those challenges can be managed by increasing responses and reducing challenges at the state and global levels. The research hence focused on how the global community should respond so as to reduce challenges to biosecurity and hence suggests recommendations so as to mitigate the threats to biosecurity at the state and global level. This phenomenon of competition among great powers has generated many challenges to biosecurity. The vulnerabilities to the domain of biosecurity have much increased due to great powers competition. Hence in the COVID-19 outbreak, the Great power competition has lowered the measures of biosecurity and increased many threats to it.

Challenges to Biosecurity

Biosecurity today is facing many challenges. Some of the challenges are enumerated below:

Communicable Diseases which Occur Naturally

Infectious diseases are one of the major challenges to biosecurity in today's world. These infectious diseases throughout had caused significant devastations to human populations. Despite the fact they occur naturally their infectious nature can cause more destruction to humans and can infect large populations than war.

*BS International Relations, National Defence Univercity, Islamabad, Pakistan.
Email: tayyabajanjua83@gmail.com
†Chairperson, Department of Politics and IR, International Islamic University, Islamabad, Pakistan.
‡PhD Scholar, Department of Politics and IR, International Islamic University, Islamabad, Pakistan.

In history, there had been numerable infectious agents which affected the great regions of the world beyond the territorial lines. The pandemics like bubonic plague and Spanish flu (NMN. 2010) in history affected populations on a massive scale and put an end to millions of lives. In today's world diseases like cholera, yellow fever, Aids and malaria are contagious in nature and hence can affect large populations. As a result, these infectious diseases are a major challenge to biosecurity in the contemporary world because these diseases do not remain within the borders and in this way a significant challenge to biosecurity.

Although in the 1960 and 1970 various antibiotics and vaccines were formulated against infectious diseases like measles over time there were certain infectious diseases like tuberculosis staged back as the bacterium of tuberculosis known as Mycobacterium tuberculosis can develop resistance against the antibiotics. Such infectious disease in this way becomes a significant threat to biosecurity. Moreover, there are other infectious diseases like hepatitis, SARS and influenza whose bacterium and virus strains change their shape and can become resistant to antibiotics and vaccines. The majority of the time these diseases have emanated from developed states like European states, Japan and North American states instead of economically developing states. The trade, businesses activities, colonization and immigration of people from developed states resultantly spread infectious diseases to other regions of the world. Hence makes the situation worse because it is much more difficult to combat pandemic rather than epidemic.

COVID as an Infectious Disease

In the 21st century when the world has seen remarkable development in science and much high level of technological advancement the COVID pandemic has emerged as a major challenge as it has threatened innumerable lives and economies of states. The coronavirus has killed people on large scale and as of Jan 22, 2021, the outbreak has taken the lives of 5,603,940 people as the virus of corona disease is infectious and it transmits from one person to another easily. In Sept 2021 the delta variant of SARS-CoV-2 was considered as most contagious. Moreover, it was termed a "variant of concern" by WHO and CDC because of its easily transmissible nature from one human to another. The variant of the virus was even transmissible to vaccinated persons. (CDC&P 2020) Moreover this infectious agent although started in a single country but later spread all over the world. This infectious disease not only took the lives of millions of individuals and had overarching impacts on states but it emerges as a challenge to disease control and crisis management. Hence its infectious nature emerge as a threatening challenge to biosecurity.

Bioweapons Possessed by States and Non-State Actors such as Radical Extremist Groups

Possession of biological and chemical weapons by states and non-state actors is a paramount challenge to biosecurity. Throughout history, these weapons have been used by states and non-state actors against their adversaries in order to vanquish them and as a result, these weapons killed a large number of people like nuclear weapons bio and chemical weapons also cause destruction on a massive scale.

Geneva protocol of 1925 restrained states from using poisonous gases and other biological methods in warfare but the production and stockpiling of bio and chemical weapons were banned. But the major powers of the world not only continued the mass production, accumulation and stockpiling of bio and chemical agents rather these deadly weapons were used in world war II and in the cold war era by the states. Hence as a result of this Biological and Toxin Weapons Convention of 1972 was signed that prohibits the states from developing, stockpiling and further producing and transfer of bio and chemical agents. As the treaty does not include formal measures which grant the assurity of compliance by the 144 states the loophole in the treaty became perspicuous when Iraq President Saddam Hussein used chemical agents as a weapon against the Irani and the Kurdish (Barnaby 1988) in the 1980s and moreover after the Gulf war of 1990-1991 UN found and destroyed a massive quantity of chemical weapons by Iraq. Further, the

signatories of the convention are 109 and only 22 states have ratified the treaty.

The treaty prohibits states from executing offensive research but does not restrain states from conducting defensive research. This meant that states will continue their research work with bio and chemical pathogens of offensive nature and hence states possess the capability of using these deadly weapons. This has generated further insecurity and hence this possession of capability by states possesses a major challenge to biosecurity at the global level. According to the report by the U.S government number of states are carrying out chemical weapons programs while nearly 13 states are believed to be pursuing biological weapons. (Elisa 2021)

Biological and chemical weapons in the hands of non-state actors are a major threat to biosecurity. Although pandemic like COVID has far-reaching implications on the world still the existing threat of non-state actors' possession of chemical and bioagents is more alarming and horrifying. The possession of these deadly weapons by terrorist groups is not a threat but an appalling reality. This reality falls into place when the religious extremist group Rajneesh 1984 used bioweapon to achieve their political aim. The attack killed hundreds of people. Moreover Aum Shinrikyo, a Japanese terrorist group used chemical agents such as Sarin gas and Botulinum in different incidents. In addition, militant group Al Qaeda was accused to develop the bioweapon program. Al Qaeda and Iraq were even blamed for the anthrax attack (also known as Amerithrax) which took place after the incident of 9/11. Even the extremist group declared their intention to acquire and use biological weapons. (Report 2006)

Moreover, the fact that the possession of biological and chemical weapons is a serious threat is made clear when the UN investigators find out that ISIS used these lethal weapons against the Iraqi prisoners. The report stated that "Weaponize vesicants, nerve agents and toxic industrial compounds are suspected to have been considered under the program." The use of deadly pathogens by the terrorist groups makes it clear that the possession of chemical and bioweapons is a serious threat and a significant challenge to biosecurity.

The situation becomes more challenging when the states are involved in sponsoring the radical groups to achieve their self-interests. History showed states that when states were involved in competition they even supplemented the bioterrorists. States assisted the terrorists in bioterrorism activities. Even the United States President after the 9/11 incident stated that "countries that seek weapons of mass destruction and support international terrorism may assist terrorists in getting chemical, biological or nuclear weapons." Hence a state supporting the radical groups in acquiring the bio and chemical weapons is a significant challenge to biosecurity.

Laboratory Research a threat to Biosecurity and Biosafety

The third major challenge to biosecurity is the laboratory research of chemical and biological agents. Scientific research facilities face the increased responsibility to manage the menaces and risks linked with the chemical and biological toxins. These risks include both biosafety (accidental) and biosecurity (deliberate) risks. The incident which shows that the biosafety was breached encompasses laboratory-acquired SARS and an upsurge of foot and mouth disease in the United Kingdom. Further, the 2001 anthrax letter attack was another incident that showed that scientific research was used negatively and hence laboratory biosecurity was breached. As the authorities suspected that the culprit of the incident stole the bacterium of anthrax from a U.S government based laboratory which was used in the attack moreover the perpetrator was himself a prominent microbiologist and foremost scientist who was working in that laboratory.

The misuse or the dual use of scientific research is a major challenge for biosecurity as controlling the dual use of scientific apparatus and scientific knowledge is immensely difficult because the intention of the user is the significant factor that categorizes the research as either legitimate or illegitimate. Hence the problem that the scientist in the lab can exploit the sensitive material for either capital gain or other objectives is a serious challenge to biosecurity.

Lack of Cooperation among Great Powers and Coordinated Response

Lack of cooperation among states at the international level is a significant challenge to biosecurity. The obstinacy of the state makes any situation worse and hence difficult to combat any pandemic. After the emergence of the COVID pandemic, the great powers involved themselves in competition instead of cooperation. The great powers like China and Russia started to play the blame game and accused each other that viruses emerging from their state. Moreover, the U.S president halted the funds of WHO which made the situation deteriorate. The great powers not only involved them in competition rather they also indulge in vaccine diplomacy. These great powers tried to manipulate and take advantage of the crisis and used vaccines for political benefits China stated that any state who seeks vaccine aid must end its relations with Taiwan.

Hence not only the non-cooperative behaviour but also taking benefits of crisis situation make any pandemic worse. This makes the situation more difficult for underdeveloping states to combat. Moreover, this competitive attitude among great powers is a serious challenge for biosecurity.

Improving responses and Reducing Challenges: Recommendations:

State-level response

The State should Prepare them to Combat the Crisis

Infectious diseases are one of the major challenges as combating this threat is very difficult. For this reason, states should prepare themselves to such a level that if some pandemic or epidemic breakout the state should be able to confront it effectively. The state should focus on the increasing standard of different sectors and their capacity. The sectors like healthcare, social work, IT and technology performance must be observed strictly in peaceful times before the emergence of any crisis.

The state should work to enhance the institution's capacity so that if any crisis emerges these sectors must be able to respond effectively. Strategies must be built by states so that if any infectious disease spread out the state without being panic generate a constructive response. The state must work to improve its capacity for pandemic detection. Hence the state must work on emergency preparedness prior to the situation of any emergency. It should strengthen its ability the prevention of pandemics and if any pandemic breaks out it must build up a strong pandemic response. These prior actions by the state will help to mitigate any sudden outbreak and moreover combat it effectively. Hence minimizing the loss and damages which may occur as a result of the pandemic.

Revamp Surveillance System

The state should increase its surveillance system so as to counter the pandemic effectively. It must incorporate procedures that determine the source of an outbreak of disease and moreover also point out factors that assist in the spreading of disease. Hence by identifying the factors the state can work to mitigate the spread of infectious diseases. The state must identify the people which are infected, the ways or methods in which the disease spread and hence generate a response according to the situation. The state must ensure cooperation among all members of society and multiple sectors of the state in order to generate a coordinated response.

The state must be vigilant enough in order to ensure that bioscience facilities are in the right hands. Like in the anthrax attack incident the perpetrator was a leading scientist in the U.S laboratory and he was involved in the attack hence state must induce such procedures which ensure that the scientists working in the research laboratories are trustworthy and they would not exploit the knowledge of science or use it for their personal benefits. Moreover, a state must increase its technological capacity and increase its surveillance to make sure that the chemical and bioweapons do not reach in hands of non-state actors like extremists groups. Hence keeping the weapons of mass destruction out of radical groups' reach must be the state's foremost priority.

The State must Work to Mitigate the Spread of Disease

Minimizing the spread of the disease must be the state's major responsibility. The state must

initiate such regulations and laws so as the limit the spread of disease at a much wider level. Laws must be formulated according to the seriousness of the disease and the state must also ensure that these laws are abided by the citizens of the state.

This formulation of laws by the state will help the state to lessen the spread of disease. Laws like maintaining a safe distance between two individuals and wearing masks in public must be strictly followed and if citizens do not abide by the laws they must face a certain penalty. This formulation of law will help the state to mitigate the spread of disease.

Provision of health facilities by state and increase awareness:

The state must provide basic health facilities to its citizen and ensure their availability to all citizens hence it must ensure the provision of services on a non-discriminatory basis. The state must ensure the provision of essential drugs in pandemic times. Like in the COVID pandemic state must ensure the free availability of the vaccine to citizens. Also as the developing states lack the standard health facilities and are at a crisis point in the provision of health care in such a situation the developed states must come forward and help the developing states to come out of the crisis.

The state must create awareness among its citizens via different platforms of media, newspapers and other information disseminating methods. Like in the recent outbreak of the COVID pandemic awareness must be created regarding the lethality of the COVID virus. Citizens must be informed to maintain a safe distance between two individuals, mask-wearing must be ensured especially in places where physical distance is not possible.

People should be informed that they should wash their hands often, use water and soap to wash their hands properly, cover their nose and mouth with elbows while coughing or sneezing and people should stay at home if feeling unwell. People must be guided that vaccine inoculation is necessary for their better immunity. Because during the crisis misinformation spread which mislead the people. Hence the state must work on such gaps so that people get themselves vaccinated and this is only possible through creating awareness among the people of the state. Moreover, innovative strategies to create awareness among the general public must be adopted.

Global Level Response

States Should Increase Communication and Enhance Cooperation at the International Level

States at the international level must cooperate with each other instead of competing against each other because their competition increases threats to the domain of biosecurity. The international community must work jointly, pursue their mutual interests collectively and moreover guard global biosecurity in order to avert the threats to biosecurity. The international community should cooperate with each other so as to formulate a global forum in which state and non-state actors are involved and these actors in the forum should discuss how the risks to biosecurity should be managed while considering how the exploitation of chemical and biological agents can be managed. Moreover, states must enhance communication channels and discuss how the benefits of chemical and biological weapons research can be enhanced and distributed equitably among the states. (Report, 2009)

States must improve communication internationally, improve the coordination among each other at the multilateral level and information must be exchanged among international institutions so as to generate an effective response towards any threat.

Moreover, the international community should work on developing collective vaccines instead of formulating individual. As in the pandemic, each great power manufactures their own vaccine-like vaccines formulated by China including Sino pharm, Sinovac, Russia formulate Sputnik V, Moderna COVID-19 vaccine developed by an American company, AstraZeneca is British-Swedish. Hence in the pandemic times, these great powers mentioned that specific vaccines must be used for entering their states China only allowed those foreign visitors who had Chinese made vaccines. The global community must work collaboratively and formulate a collective

vaccine so that states do not get involved in acts of manipulation in a crisis situation.

The International Community should Establish Funds for Biosecurity

The states at the global level and the international community must establish specific funds for biosecurity. The international community must allocate funds so to combat the challenges to biosecurity. If any state is vulnerable due to a pandemic outbreak or it is threatened by non-state actors like the extremist terrorist group in the context of biosecurity then the international community must generate a coordinated response towards it. Funds must be generated at the international level collectively and they must be named biosecurity funds. The international institutions must work in this domain and generate funds to combat the challenge to biosecurity at the global level and even if a single state is affected there must be a coordinated response.

Laws Formulated Regarding Regulations of State and Non-State actor's Possession of Chemical and Bioweapon must be Improved

The global community must improve the laws regarding regulations of state and non-state actors which possess bio and chemical weapons. Previously the protocol and convention regarding biological and chemical weapons have been formulated. Like in 1925 Geneva protocol was signed which prohibits the states from using bio and chemical weapons in war. But still, in World War II and in cold war great powers used deadly pathogens against their adversary. Moreover in 1972 a disarmament treaty known as the Biological Weapon Convention was signed which prohibits the states from producing, developing, transferring and stockpiling chemical and biological weapons by states. But still, the great powers like the U.S involved in defensive programs and hence this raises concern among other great powers. Moreover, according to Russia, the United States is carrying out research on smallpox which is prohibited by WHO.

The Russian government accused the U.S of executing research so as improve its defence attack bio-terror attacks which is "especially questionable from the standpoint of Article I of the BTWC." Similarly Russia's fulfilment of its obligations regarding the article I of the convention are unclear. Even the report of 2017 states that Russia's annual BWC CBM submissions since 1992 have not convincingly reported whether the biological weapons were destroyed or diverted for peaceful purposes, an Article II of the biological weapon convention.

All this manifests that the loopholes still exist in the implementation of existing conventions. Hence this means that the laws regarding the regulations of existing conventions and agreements must be improved. Moreover, the laws regarding the regulation of the possession of bio and chemical weapons by states and non-state actors must improve so as to improve the biosecurity domain.

Improve Laboratory Biosecurity and Measure Biosecurity and Biosafety

The global community must work on measures to enhance laboratory biosecurity and measures regarding biosafety and biosecurity must be improved at the international level. Laboratory biosecurity is basically the protection, control and accountability of valuable biomaterial inside the labs so that the material is prevented from "unauthorized access, loss, theft, misuse, diversion or intentional release." (WHO 2006) The international community must work towards the prevention and hence introduce such measures so that lab biosecurity is not harmed or challenged.

The accountability regarding laboratory biosecurity must be done at the international level and laws regarding bio risk management and bio risk prevention must be formulated before if any challenge emerges the global community can tackle it effectively.

Further states must cooperate and collaborate at the international level so as to improve measures regarding laboratory biosecurity because after the pandemic of coronavirus which affected all the states of the world the great powers must realize that any challenge is a global challenge and it must be mitigated collectively.

Increase Research on Strains that are Resistant to drugs and Further Increase

Infectious diseases are a major challenge to biosecurity as the strains of bacteria and viruses are mutant and hence become resistant to antibiotics and antivirals. The research at the international level must be enhanced on the strains which are resistant to drugs as they are a major challenge. As in the COVID pandemic, SARS-CoV-2 causes COVID changes and as a result, it was difficult for the global health community to combat the pandemic. Thus the global research programs should increase research in this domain as the research on the evolutionary mechanism of bacteria and viruses that are resistant to antimicrobial substances will play a significant role in the prevention of infectious diseases. In addition, working on increasing the strength of anti-microbial is an essential key to preventing resistance to drugs and the spreading of transmissible diseases.

Conclusion

Great powers had always been in competition against each other in the international system. Even in history, the great powers competed against one another. These great powers due to the competitive situation among them used different techniques and manoeuvres to vanquish their opponent. The great powers even in history used chemical and biological weapons against the enemy. Hence in the 20th century the great powers during World War I, World War II employed bio and chemical agents. After World War II two states Soviet Union and the United States emerged as superpowers on the map of the world. These two were involved in the competition and hence as result went into a situation of security dilemma. These two great powers were not only involved in the arms and nuclear race they were also involved in the production and stockpiling of bio and chemical weapons. These states also employed chemical weapons during proxy like chemical weapons were used by America in Vietnam War. In the contemporary scenario, great powers like China and Russia have emerged as revisionist powers again after a few decades when the U.S was the sole superpower in the world. Hence the great powers again have entered into the phenomenon of competition against each other. These great powers even in the emergence of the COVID-19 pandemic which has shaken the whole world were involved in the competition.

The challenges to biosecurity can minimize only when the states instead of losing themselves in the competition should look for ways to cooperate with each other. Because only due to cooperation it is possible that states can compete with any challenge and meet the posing threats to biosecurity. Hence the great powers should generate a coordinated response. The great powers besides individual response must look into ways of generating a global response in order to combat any crisis effectively and meet the challenges to biosecurity.

References

Barnaby, F. (1988). Iran-Iraq War: The Use of Chemical Weapons against the Kurds. *Ambio* *17*(6),407–8. http://www.jstor.org/stable/4313511.

CDC. (2020). Coronavirus Disease 2019 (COVID-19). *Centers for Disease Control and Prevention*, https://www.cdc.gov/coronavirus/2019-ncov/variants/delta-variant.html.

Elisa D. H. (2021). Chemical and Biological Weapons: Prospects and Priorities after September 11 *Brookings*. https://www.brookings.edu/articles/chemical-and-biological-weapons-prospects-and-priorities-after-september-11/.

NMN. (2010). *Biosecurity Challenges*. News-Medical. Net. https://www.news-medical.net/health/Biosecurity-Challenges.aspx.

Report, IPI. (2009). "Biosecurity: Task Forces Strengthening Multilateral Security Capacity", IPI Blue Papers, Vol No.6, 2009 https://www.ipinst.org/wp-content/uploads/publications/biosecurity_epub.pdf

Report. (2006). "The Biological Weapons Threat And Nonproliferation options", Carnegie Endowment for International Peace, Page No. 11-12, November 2006. https://carnegieendowment.org/files/BIO-survey-final-report.pdf

WHO. (2006). "Bio risk management: Laboratory biosecurity guidance", World Health Organization, September 2006. https://www.who.int/csr/resources/publications/biosafety/WHO_CDS_EPR_2006_6.pdf