

## Influence of Bioterrorism: Challenges and Prospects

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**Abstract:** *While terrorism is a crime motivated by politics, ideology, or history, bioterrorism is a more sophisticated kind of terrorism that uses biological agents or toxins to harm humans, other organisms, or the environment. Bioterrorism has spread many diseases, including Anthrax, Plague, Tularemia, Smallpox, Dengue Fever, and COVID-19. Whether bioterrorism is a myth or reality, the acceleration of bioterrorism threats, as seen in the case study of COVID-19, and bringing attention to the consequences of bioterrorism are the goals of this research. Exploratory research is conducted for the purpose of this study. Research problems have been answered using a combination of qualitative, historical, analytical, and predictive methodologies. This research delves into how the COVID-19 Pandemic has affected Pakistan and the rest of the world. Some examples are changes in the tourism industry, public health, education, politics, and the spread of fake news and disinformation. The study brings attention to the possibility of future bioterror attacks in the form of novel diseases propagated through viruses or bacteria, such as COVID-19, which can lead to more catastrophic scenarios.*

**Key Words:** Bioterrorism, Covid-19, biowarfare, 5 GW, pandemic

### Introduction

Terrorism is a crime with deep ideological, historical, and political roots. Terrorism is the root cause of all the world and most of the regions' issues. Over the centuries, ever since the regime in question came into being, humanity has used terror as a tool of power. Terrorism, and the potential for the release of bioagents, whether on purpose or by accident, remains at the top of the political agenda on a local, national, or international scale. According to Ronczkowski (2018), terrorist acts are defined by their premeditation, political motivation, and the involvement of subnational

groups that pay close attention to their audiences.

According to the Pentagon, terrorism is "the deliberate use of violence or the threat of violence to inculcate fear; intended to coerce or intimidate governments or societies in pursuit of goals that are generally political, religious, or ideological" (Whitley, 2003). One of the key goals of terrorists is to draw attention to themselves so that they can target vulnerable parts of society.

An ex-U.S. Army officer defined the strategy of "Fifth Generation Warfare" by admitting that it was used against opponents and rivals; the strategy's three components are

"convinced," "confuse," and "conflict." The officer went on to emphasize that the United States had self-interested goals and strategies. The most vulnerable population, and the primary focus of fifth-generation warfare, are young people who are active on social media. It's helpful to look at the history of warfare in terms of distinct eras. There have been three generations of warfare development: "1GW-War of Line and Column." The Second Great War, or the War in the Trenches. 3rd Generation Warfare, or Maneuver Conflict. Fourth Generation Warfare: Unconventional Conflict. Differences between 4GW and 5GW lie in their motivations, technologies, and the empowered individuals behind them. Conventional and nonconventional forms of warfare (1GW, 2GW, and 3GW plus 4GW and/or 5GW) come together in hybrid warfare. The transformation of conventional ways of terrorism to unconventional ways is Bioterrorism. It is the advanced shape of terrorism by which the world has been ordained. The enemy is unfamiliar, lacking institutions, uniforms, and a defined organization. It uses unconventional weapons, including biological, chemical, and nuclear weapons. Bioterrorism or biological attack can be described as the release of bacteria, viruses, and various other microbes that have the capacity to sicken or kill masses, crops or livestock intentionally. The 21<sup>st</sup> century can be termed as an era of new-world terrorism. Terrorists target the main people by employing different types of weapons and biological weapons are among them.

## Review of the Literature

Stock (2020) divided the background of biowarfare into three distinct eras in his analysis of the topic. The primary section examines epochs prior to and including the twentieth century. In this time period, germs were already being blamed for a wide range of ailments before the advent of modern science. The period from 1900 to 1945, which includes the two world wars and the employment of biowarfare by non-state entities like criminals, is the second. Germany initiated the first state-sponsored act of bioterrorism. Time period three covers the end of the second world war in 1945 and the present. The United States and the Soviet Union deployed their top-of-the-line

biological weapons during the cold war. Although Seth provided a thorough overview of the development of bioterrorism, he did not elaborate on how to handle potential crises in the future; this research aims to fill that gap.

A description of biological weapons employed in biological warfare was provided by Bernard, Bowsher, Sullivan, and Gibson (2020). It caused widespread panic and chaos, either organically among the populace or artificially by nation-states seeking to overthrow their adversary's government. Acts of crime are those carried out by non-state actors for financial benefit. The term "biowarfare" has always referred to the use of biological weapons or the threat to use them. However, as the globe reached the third decade of the 21<sup>st</sup> century, the same goals were achieved at a breakneck pace through disinformation and misinformation campaigns. There has been a constant stream of conflicting scientific and political information regarding the epidemiology, natural history, and clinical outcomes of the COVID-19 pandemic. Information about the pandemic's effects was widely disseminated as governments scrambled to take action in response. Disinformation and epidemics go hand in hand, and the proliferation of bogus news on social media has further exacerbated the problem. In this study, we'll look at how misinformation and disinformation spread by 5GW affect people's actions during times of crisis.

According to Loike and Fischbach (2012), after 9/11, anthrax bacteria-containing letters were sent to multiple media outlets and two U.S. Senators, resulting in the deaths of five people and the illness of 17. In the beginning, there was Bob Stevens. Although the five fatalities from the anthrax attack were cause for much alarm. A biological weapon introduced into the food supply, water supply, or air supply can kill untold numbers of people and animals without being detected in the same way that a nuclear bomb can. Being well-prepared is essential for rising to this task. Any person motivated by the desire for financial gain could engage in such dishonest behaviour. To prevent a bioterrorist strike in the United States, education must emphasize ethical principles and improve public awareness. Outside of the United States, no topic is covered in this article. There are many approaches that can be taken to combat

this situation. The current investigation will fill in this blank.

Terrorist organizations are increasingly turning to bioterrorism, a concern that was brought to light by Dass (2021). Terrorist organizations publicized their groups by capitalizing on the global pandemic. Terrorists now have an easy-to-use weapon in the form of a virus that has a devastating long-term effect. Technological advancements in the modern era have made the production of biological weapons simple and inexpensive. In 1990, when they first had the technology to use bio agents, bioterrorist attacks began. He also cautioned that we need to evaluate the potential danger posed by biotechnology. Dass has touched on numerous topics, but he hasn't addressed what may be called crisis management.

Loike and Fischbach (2012) asserted that after 9/11 anthrax bacteria-containing letters were addressed to various news media offices and two U.S. Senators, killing five persons and sickening. The first of them was Bob Stevens. While a lot of concern was created at five deaths in this deliberate anthrax attack. A biological weapon used through food, water, and air can work like a nuclear bomb causing uncountable deaths in humans and animals without detection. To meet this challenge, it is crucial to be prepared in advance. For financial gains, any individual might engage in these unethical practices. It needs to educate the youth ethically and raise awareness among the masses to avoid this type of bioterror attack in the USA. This article deals with the only USA the rest of the world has not been discussed. This crisis must be tackled in various ways. The present study will bridge this gap.

Dass (2021) highlighted the expected global threat through bioterrorism which is being used by terrorist groups. Terrorist groups used the world pandemic to promote their networks. The long-lasting effect of the virus has been acknowledged by terrorists as an easy weapon to use. During modern times, the development of technology has made it possible to develop biological weapons very easily and cheaply. The bioterrorist incidents started in 1990 as soon as they achieved the capacity of utilizing bioagents. He further warned to assess the expected threat through the use of biotechnology. Dass has mentioned

many aspects but left a gap that can be termed as management during the upcoming crises.

Skopec (2020) cited Dr Boyle, who discussed the Wuhan coronavirus outbreak and the BSL-4 laboratory from where the virus escaped. The infection might be quite dangerous, he said. Chinese authorities initially wanted to keep this information secret because of its potential use as a versatile bioweapon. The 2019-CoV infection is presumably a weaponized form of the NCoV, which was first discovered in 2012 by doctors in Saudi Arabia. The media establishment continues to attribute COVID-19's start point to the Wuhan Seafood Market. India has launched a comprehensive probe into the Chinese Wuhan Institute of Virology. Researchers from the United States, China, and India studied bats and humans in the northeastern state of Nagaland (close to China) who have antibodies to deadly viruses like Ebola. There needs to be an investigation into the Wuhan outbreak. This research will fill the void in our understanding of how to counteract this type of biological weapon.

Stock (2020) drew attention to a new INTERPOL study that examines how COVID-19 impacts global terrorism, current trends, and potential risks associated with attacks on susceptible targets (such as bioterrorism). In this research, we use the term "bioterrorism" to refer to the assessment of COVID-19 and the strategy and capabilities of terrorists and other non-state actors (NSAs). The paper highlights the critical need to monitor the reaction and response of terrorist networks, violent extremist groups, and other potentially damaging non-state actors as COVID-19 events diminish in certain regions while increasing in others.

Terrorists have a natural ability to materialize bioterrorism, as Townsend (2021) outlined in his study on the covid-19 phenomenon. For terrorists, it serves as both an effective tool and an inspiration. Prepare urban areas for bioterrorist assaults by implementing global plans. The more accessible bioweapons are to develop, the more dangerous they are. The devastating effects of terrorism were made evident, and it exacerbated social and economic unrest. Although the danger posed by biological agents is not new, only recently have international organizations begun to see it as a serious concern. It's a danger that many

urban areas aren't prepared to handle. Each individual citizen has a responsibility to help the state prepare for and respond to the impending threat of bioterrorism as a fellow member of the social contract. With the help of this report, local, national, and international crisis response and bioterrorism preparedness have become more consistent with one another. Responses against bioterrorism in urban areas have received a lot of advice. These guidelines are broad and not location-specific; this is a hole that the current research hopes to fill by focusing on the crisis management aspects of a potential bioterrorist assault in a developing country.

### **Repercussions of Bioterrorism and Precautionary Measures**

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Realistic data suggests that microorganisms have considerably more destructive and horrifying power than nuclear weapons, as COVID-19's devastating effects on people, families, communities, and the world at large attest. When compared to the ease with which germs can be used and propagated, nuclear bombs are extremely complex to manufacture. Countries and terrorist organizations are tempted to resort to such extreme measures of biological destruction because of their insatiable appetite for power and dominance. And then there are the laboratories that have emerged with the purpose of developing extremely dangerous and destructive germs for research and study. Similar to the Sword of Damocles, these threaten all of humanity. (Nie, 2020).

### **Global Consequences of Bioterrorism**

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There are many different forms of ramifications that can result from bioterrorism, and they can have a significant effect on many different facets of society all across the world.

### **The Monetary Effects**

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Since the globe has become a global village, every big event, whether positive or negative, has far-reaching effects on the global economy. The historical evidence presented in chapter two bolsters the strong belief that bioterrorism will have far-reaching effects on the economy. From studying past events, we can learn how bioterror attacks have changed the world in

specific regions. Globalization, urbanization, and environmental change have all contributed to the rise in the frequency and severity of infectious disease outbreaks and epidemics, making a concerted international effort necessary to combat them. Human and animal monitoring, workforce preparation, and enhancing laboratory resources are all examples of ways in which low-income and high-risk countries can improve their public health capacities with the help of national resources and international donor funds. Despite the fact that most industrialized nations, especially in Europe and North America, have robust real-time surveillance and health systems to control the spread of infectious illness. There has been a need for international cooperation among governments, non-governmental organizations, and corporate alliances to expedite the development of creative responses to emerging illnesses that have the potential to become pandemics.

Economists estimate that the COVID-19 pandemic may shave 3.0-6.0% off global economic growth by the end of 2020 (Verma & Gustafsson, 2020). When comparing February to January, the output index in China fell by more than 54%. Fear and anxiety caused by the pandemic, as well as lowered household finances and income, often caused customers to alter their shopping patterns, which in turn impacted economic output. Since fewer people are taking vacations and using taxis, these industries have taken major hits. We now know about COVID-19 from every corner of the globe. There will be significant effects on the global economy as a result of the current study's demonstration of the reality of bioterrorism/COVID-19. The global economy was shattered, and the whole geography of the globe was altered, as nearly every nation on Earth fell into lockdown and aircraft was halted, and travel to and from the COVID-19-affected countries was outlawed. The market economy was profoundly affected by the new standard of "work from home."

The economic situation of those who lacked computer literacy worsened. They lost a lot of money since their businesses had to shut down and because their stockpiles in warehouses and stores quickly ran out of food and other perishables because of the COVID-19 regulations. Meanwhile, individuals who were

already well-versed in IT or who had only a passing familiarity with the web took advantage of their spare time to study the field in depth and launch successful online businesses, thereby improving their financial standing. The vast majority of the wealth generated by the COVID-19 pandemic was concentrated in a small number of hands, including healthcare facilities, pharmaceutical firms developing treatments and diagnostic tools, mask manufacturers, and providers of other necessities like gloves and masks. In the case of COVID-19, as with any other bioterrorism strike, it will have far-reaching effects on the economy, disrupting the economic and financial might of the people, the society, the country, and the world.

### **Consequences for Public Health of Disinformation Campaigns**

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For a number of years now, disingenuous and incorrect medical content pertaining to a wide range of illnesses has circulated widely via virtual entertainment, posing a real and present danger to public health. These strategies of misinformation can be planned, and it takes a concerted effort on everyone's part to counter them. In other cases, the spread of bad advice is due only to a lack of familiarity with reliable sources of information. As a result of the coronavirus epidemic, the dangers of disseminating false information have taken on new dimensions. According to the World Health Organization, false accusations are spreading more rapidly than the coronavirus itself. This epidemic has been called a "global information pandemic" by the World Health Organization. From "Information" and "Pandemic," the name "Infodemics" was created.

Epidemiology, the branch of medicine that studies the spread and management of disease in human populations, has become a household term thanks to its central role in modern medicine. Infodemiology is yet another term that has to be created. For the sake of the electronic media, notably the internet, or the individuals who will be informed on public policy or public health, this term has been described as the distribution and harming of information. People had a hard time acquiring accurate information and, as a result, were either too terrified to take any action or too

certain that they were safe. The social isolation tactics employed to control the disease, as well as the apprehension and concern brought on by a lack of information, raise concerns that the actual risk to public health may be higher.

Because they have special health challenges associated with the coronavirus, such as a lowered resistance to infection, says Union for International Cancer Control (UICC) Director of Special Projects Julie Torode. "Fake News: a threat to public health (2020) warns that "false information not only misleads and causes anxiety but can also be harmful if it suggests risky health-preserving measures or treatments."

### **Effects of False Information and Disinformation Spread on Social Media**

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There is a difference between information and misinformation when the former cannot be backed up by evidence or an expert's view. In the scientific community, previously held beliefs can be revised in light of new data and consensus among experts, but erroneous information is often resistant to correction. Misinformation and disinformation can be influenced by negative, subjective voices, which can, in turn, make genuine institutions suspect and uneasy. The potential for far-reaching impacts makes this particularly worrisome in terms of health and misinformation-related problems. Measles has caused epidemics in several countries, including the US, Philippines, Ukraine, Venezuela, Brazil, Italy, France, and Japan. Misinformation and deception about vaccines have led to the resurgence of many diseases that can be prevented by vaccination. Misinformation communicated over social media during the COVID-19 pandemic has led to people self-medicating with unapproved and potentially dangerous medications and to panic buying out of fear of a total shutdown.

### **The Struggle for World Dominance**

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Since COVID-19 broke out in Wuhan, China, many people have speculated about where it came from, but the true origin of the Coronavirus has remained a mystery. Both the Chinese and the Americans named the other as a suspect. A Wuhan seafood market called Huanan is where Chinese authorities say the



coronavirus first appeared in nature. The United States and other countries, however, were not ready to acknowledge it as authentic; they instead had the unshakable belief that the virus had been created in a laboratory in Wuhan. China and Taiwan settle their differences over Bat markets after reaching an agreement. Instead of continuing to go into the claims, China simply outlawed the malware altogether. Concerns were raised over whether or not China was behind the spread of the virus as a bioterror weapon, with the goal of bolstering the economies of other countries and advancing China's own ambitions of global hegemony. China's failure to cooperate with the WHO by sharing vital information or providing adequate detail about the virus's potential public health crisis is a violation of China's international duties, which other governments may dispute in the International Court of Justice.

This competition for world dominance recast the planet as a whole (Ajodo-Adebanjoko, [2022](#))

### **Regional Consequences of Bioterrorism**

The effects of bioterrorism on a regional scale are far-reaching. COVID-19 quickly spread to nearly every nation and effectively shut down global commerce. COVID-19's behaviour varies, but it does so in different ways in other places. Since both the study and the researcher are based in South Asia, we shall focus on the effects of bioterrorism in that region. The culture of South Asia is the basis for this. In addition to providing sustenance and food, it also serves as the principal source of income for millions of locals. South Asia has one of the highest population densities in the world. Farmers in South Asia care for approximately 20% of the population on only 5% of the world's farmland. South Asia is one of the poorest regions in the world, home to one-third of the world's impoverished. The consequences of bioterrorism on a continental scale can be devastating and far-reaching.

### **The COVID-19 Pandemic, Climate Change, and South Asia's Food Crisis**

It is now more challenging to secure food and nutrition security and the sustainability of livelihoods in South Asia due to the novel

Coronavirus/COVID-19, which has impacted a wide range of agricultural and supply chain operations. To make matters worse, farmers in South Asia also have to deal with the fallout from the Covid19 outbreak and the consequences of climate change. Action must be taken quickly and clearly to resolve the extraordinary Coronavirus problem and restore food and nutrition security, thereby protecting human life and preserving economic productivity. Joint efforts at the local, national, and international levels are essential for mitigating the consequences of COVID-19 and global warming. In order to restore the damaged horticulture production network, the countries of South Asia should work together to exchange lessons learned and implement appropriate repairs. Both the coronavirus and the climate change problems require new strategies and methods. Resilient and sustainable food systems can be shifted into high gear more quickly than usual thanks to the COVID-19 pandemic's disruptive forces and recovery policies. Some of the short-term aid for COVID-19 problems can be linked to investments in natural capital to boost productivity and resilience in the long run.

One of the most urgent problems facing South Asian countries and other developing nations is how to adapt to the consequences of climate change and build agricultural and food systems that are climate-resilient, environmentally friendly, and beneficial to public health. Both the COVID-19 epidemic and global warming are exacerbating these problems. Although irrigation infrastructure has improved greatly over the past few decades, much of the agricultural land in this region still relies on rainwater and is thus highly susceptible to the effects of global warming. As a result of global warming, agriculture, and food security in the region are under threat from fluctuating temperatures, altered precipitation patterns, and accelerated glacier melting. Because of the novel coronavirus COVID-19, food and nutrition security, as well as the ability to provide for one's family, have become even more precarious in South Asia (Rasul, [2021](#)).

## **Significant Impacts on South Asian Schooling during the COVID-19 Epidemic**

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In South Asia, children were the main affectee during the pandemic COVID-19. Closer schools for a long time and due to less or limited access to the internet, most of them were deprived of distance learning thus missing their universal right to education (UNICEF, [2020](#)). Starting from the lockdown as a result of the pandemic COVID-19, it is estimated that school children lost almost 1.8 Trillion hours of in-person learning. UNICEF report shows that due to COVID-19, two third of an academic year has been lost on average throughout the world (UNICEF, 2021).

To a large extent, the COVID-19 epidemic in South Asia impacted children. For many years, they were cut off from access to distance learning opportunities because they lived too far from schools and had inadequate or no internet connectivity (UNICEF, [2020](#)). As a result of the lockdown brought on by the epidemic COVID-19, schoolchildren lost about 1.8 Trillion hours of in-person instruction. On average, according to UNICEF's assessment (UNICEF, 2021), two-thirds of a school year has been wasted because of COVID-19. According to a report from the World Bank's Education Group, COVID-19 put a halt to all university-related teaching, administration, and research. By April 2020, almost 175 schools across the globe had shut down, severely disrupting the education of nearly 220 million pupils. Universities and colleges across were scrambling to find solutions to the economic crisis. There was a need for Bangladesh, India, Bhutan, Pakistan, the Maldives, Sri Lanka, and Nepal to find a way to continue offering their services to higher education institutions. In order to carry on with day-to-day operations like teaching, studying, administrative work, creating jobs, and so on, these institutions incorporated novel methods that eliminated the need for meetings and interpersonal contact. Educators, students, and other office or field workers have to rearrange their timetables to conduct business remotely rather than physically in the office. Consequently, remote teaching-learning led to a reorganization of pedagogical methods, syllabi, course outlines, and other pedagogical tools. However, barriers were erected due to

inadequate power in rural areas, inefficiency in the use of digital equipment, and a lack of technical skill and knowledge on the part of

both teachers and students. However, the widespread poverty among today's student body has rendered distance education obsolete. Because of this, there was a temporary halt in online operations at some schools. Uncertainty brought on by the epidemic also had a bad effect on the mental health of both educators and their charges. Some schools were forced to immediately halt their online courses because of this. Students between the ages of 18 and 26 were the hardest-hit demographic (Khan, 2022).

## **Effects of Economic Actions and Poverty Risks**

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As a region with a high population density, the world's greatest poverty rates, and a deficient healthcare system, South Asia has been hit hard by the current COVID-19 pandemic. As a result of a lack of investment and a lack of infrastructure, the country's economic and social conditions are bad. South Asia is home to a third of the world's poor population, making it the poorest region overall. Nearly two-thirds of the country's people call rural areas home; the majority of them work in agriculture. Prior to the spread of COVID-19, there was already widespread food insecurity. In South Asia, 271 million people were severely food insecure out of a total population of around 649 million. Likewise, 36% of the kids were short for their age, and 16% were extremely malnourished. As a result of COVID-19, the situation is expected to worsen (Rasul et al., [2021](#)). South Asian nations made severe steps to combat the COVID-19 pandemic. Among the actions implemented by several nations were the closing of businesses, hotels, educational facilities, international borders, and dining establishments, the suspension of visas, the implementation of complete international and domestic travel bans, and the prohibition of public meetings. Experts predicted that South Asian countries will face the worst economic conditions in their history, which spanned the previous 40 years. The steep decline in GDP in South Asian countries means that a large portion of the population would lose income and face rising inflation. The reduction in GDP will affect the per capita income which would

severely affect the general public's livelihood.

### **The Widespread Occurrence of Emotional Distress in South Asian Countries**

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Panic and dread in the populace can be induced by the use of biological agents. This can have negative effects on the economy and society as a whole since fewer individuals will venture out into public and spend money. The same thing happened in South Asia when H1N1 swept over the region. The high rates of worry and depression across nearly all of South Asia suggest a heavy psychosocial toll was taken during the pandemic. It is imperative that these nations place a premium on clinical and public mental health interventions, as well as the socioeconomic determinants of mental health (Hossain, [2021](#)).

An outbreak of disease, disability, or even death can occur after the use of biological agents in the community. All of the South Asian countries share weak healthcare systems and comparable socioeconomic underpinnings. The COVID-19 pandemic has brought into focus the region's weak infection control infrastructure. Early on in the pandemic, inadequate facilities and the subsequent spread within communities were not adequately addressed by regional authorities because of the premature and abrupt end to social distancing restrictions.

### **Bioterrorism's Consequences in Pakistan**

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After demonstrating the global and regional impacts of bioterrorism, this paper concludes that the phenomenon is just as concerning in the researcher's home country of Pakistan. Still, there was a wide range of reactions to the pandemic depending on characteristics including social standing and level of education. It is impossible to even begin to cover the full scope of COVID-19's impact in Pakistan in a single essay. Once news of the coronavirus and its devastating effects on the human body began to emerge from China, the rest of the world quickly learned that a pandemic had developed. In response, many emergency hospitals were set up in China for the sole purpose of treating those infected with

COVID-19. Because of its proximity to China, Pakistan was especially at risk of contracting the pandemic as a result of all these events, creating a tense political climate.

On February 26, 2020, Pakistan reported the country's first case of COVID-19. As a result of the worldwide and regional economic crisis, people's mental health and quality of life suffered. Healthcare systems began undergoing extensive transformations and alterations as a result of the deadly virus. Capacity improvements have been made to both beds and ventilators. To treat Coronavirus patients, numerous long-term zones were assigned as detachment wards. Many doctors and nurses were given assignments in isolation wards where everyone had to wear full PPE. Without a doubt, this risky and unpredictable influence had an effect on the mental health of HCWs. A study found that 50.4% of healthcare workers had anxiety and 36.2% experienced depression during the pandemic (Ullah, [2022](#)).

People who stayed at home during the COVID-19 pandemic and learned about it through the media likely experienced a range of negative emotions, including melancholy, anxiety, dread, and a lack of self-esteem. Anxiety and despair pervaded society as a result of the lockdown. People were afraid to shake hands with one another for fear of contracting a disease. As a result of the psychological effects of the 2020 epidemic, Pakistani society as a whole suffered for a period of several months. Isolation had profound emotional effects on Pakistani society as a whole.

### **Consequences for Pakistan of International Financial and Economic Crisis**

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As the news of the global pandemic known as Covid-19 spread, it had a profound impact on the economy around the world. The world economy and stock markets were both severely affected by this pandemic. Revenue losses, job losses, and disruptions in production, services, and transportation have all been experienced by numerous countries as a direct result of disease control efforts. Production drops, the death toll rises, businesses close, trade is disrupted, and the tourism industry is wiped out as a result of the



ban on air travel and other restrictions imposed on Pakistan. Pakistan's already struggling economy had to work much harder to maintain stability when the pandemic hit. There was a significant economic impact of the COVID-19 pandemic. Financial analysts warn that the effects of COVID-19 on the economy would severely hamper Pakistan's ongoing effort to recover from the severe blow to economic growth that the virus has already dealt. Pakistan's economy has shrunk as a result of the loss of 12.3 million jobs brought on by the pandemic, and unemployment has soared. Economic growth has dropped from 5.8 per cent in 2018 to 0.9 per cent presently, portending greater declines in the years to come. Pakistan currently has a fiscal deficit of around 10%, with revenues falling over the past two years as well. Given these circumstances, the COVID-19 epidemic had a devastating effect on the country.

It was estimated by the risk investigator master that the Coronavirus pandemic will cost the economy of Pakistan at least \$15 billion. According to his forecast, Pakistan's GDP will fall by 10% in the fourth quarter of the 2020 fiscal year. Negative GDP growth of 2.0% or no actual increase of GDP in 2020 would occur in the first quarter of 2021 if complete or smart lockdowns were implemented. According to a Gallup Pakistan survey, the country's unemployment rate is expected to reach a shocking 28 per cent by the end of the year. According to projections, joblessness will increase to 6.65 million in 2020-21 from the previous year's 5.8 million (Verma & Gustafsson, [2020](#)).

The severe economic repercussions made it obvious to the authorities that if the complete lockdowns continued, it would further aggravate the issue and lead toward unresolvable ways. As a result, it's crucial to find a replacement that may help alleviate stress in domestic, international, and economic domains without putting people in danger. This alternative may be called a "smart lockdown," which refers to a lockdown that has been planned out in sufficient detail to protect people while still allowing them to continue earning a living. However, if lockdowns are restored, the number of persons suffering from current diseases would climb, making a new lockdown mandatory.

When the paradigm in education suddenly shifted, it created new challenges for everyone involved. In addition to her role as a researcher, the present study's author is also an instructor at a rural, state-run university. Similar challenges were experienced by the region's students.

During the 2019-20 academic year, 840 female students registered in Okara's Renala Khurd campus of the Government Associate College for Women. At first, between 30 and 35 per cent of students signed up for Whatsapp groups or Google Meet lessons when all of the college's instructors began offering them. Later, pupils were often contacted by telephone calls; nevertheless, they always made excuses about not having a touch mobile cell by which they could participate in the study groups. There were a few who said they'd join later after getting cell phones, but many more who said they wouldn't since their families couldn't afford it. In spite of the school's and faculty's best efforts, only about 45 per cent of students were able to participate in online courses. On the other hand, there were network troubles, which could originate from either the teacher's or the student's end due to the students' remote locations.

It was an illustration supported by first-hand experience, and similar cases could be found all over the country.

## **Recommendations and Conclusion**

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Based on the findings of this study, the following guidelines have been proposed to help mitigate the effects of a bioterror attack, which is a serious problem that could easily escalate into a crisis if not handled correctly. Biotechnology, AI, big data and advanced analytics (BDAA) are just some examples of the rapidly developing EDTs with the potential to prevent, detect, and contain biological threats, whether they are manmade or natural. With today's sophisticated tools, it's imperative to employ artificial intelligence. With this skill, infections may be discovered, and AI's other strengths—processing massive data sets, analyzing patterns, and extracting useful information—are all put to good use. For the US military's early warning system against biological warfare pathogens, MIT Lincoln Laboratory researchers created a highly

sensitive and reliable trigger. The Rapid Agent Aerosol Detector (RAAD) is a trigger device that performs constant air monitoring, identifies aerosolized particles that may be threat agents, and then uses embedded circuitry to set in motion the next stages of detection. You can use systems like these to track the dispersal of bioterror agents. The medical community should be required to complete training in the detection of bioweapons. Learning about epidemiology and how to implement control

measures is a must for both the medical community and the general public.

During the pandemic, misinformation and deception spread rapidly on electronic media, especially social media, contributing to an already dire situation. The government should take measures to rein in this medium. The fight against biological terrorism necessitates the inclusion of public education through the use of electronic, print, and social media, particularly in the educational sector.

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