
Biological Weapons: covert threats to Global Health Security

Rakibul Hasan

Sub-Editor, The Bangladesh Today (TBT)
63 Holding, Word-06, Block-A, Paragoan, Kayet Para,
Demra Kaliganj T C Road, Ruggonj, Narayangonj, Dhaka, Bangladesh.

Abstract

Biological weapons, never a new phenomena in terms of health security as originated in the ancient ear and still survive today through its self-updating living germs (which is likely adapted to modern vaccinations and antibiotics) and the contribution sophisticated lab researches of reverse genetics. The paper shows the entire development eras, ranged to the present with due focus on the future bioweapons as a war strategy and, just opposite to health security. With the initiation of Biological Weapon Convention (BWC) in 1972, the bioweapons' holding countries signed the treaty clearing their stands not to produce, develop, stockpile biological weapons, and transfer the technology. Unfortunately, they had better gone to the underground with their covert research on weaponization on biological germs and viruses. Unlike chemical, radiological, and conventional weapons, biological weapons many times more deadly for its rapid transmissibility rate, self-reproduction and adaptation features. Most importantly, victim states cannot identify the release of biological agents until these turn into pandemics when it is too late.

The paper aims at proving the proposition that weaponization of biological germs and viruses pose pandemic threats to global health security of entire human race, plants, and animals as was 600 BC. However, the paper intends to deal with only human aspects now. Besides, main objectives include analyzing dangerous stockpile of bioeapons in the Middle East, USA, and North Korea etc.

With the substantial rise of non-state actors, terrorist groups and individual actors may likely access these bioweapons as it involves very easy mechanism to produce and develop germs into lethal weapons in the era of science and tech. Think what might happen if Al-Qaeda acquire it?

These qualitative research method produces a set of specific policy recommendations at the end and before, it presents some blatant criticism of Biological Weapons Conventions (BWC) and the super powers and state alliances allegedly involve in making biological weapons.

Keywords: Global Health Security

1. Introduction

Biological warfare or germ war applies biological toxins or infectious agents, which generally include bacteria, viruses, and fungi as inhumane war strategies to kill or disable opponent soldiers in war. This ancient and ever developing warfare is brutal aggression in terms of its colossal casualties associated with public health disorders along with flora and fauna around the affected sites.

Bio-weapons or bio-agents, one of NBC (nuclear, biological and chemical weapons), which causes mass destruction and Weapons of Mass Destruction too. When preemptive attacks is launched against suspected objects, it kills the targets or particular groups or objects around it but the release of bio-weapons escape nothing and nobody it affects entire population. Sates directly or indirectly develop, acquire and, stockpile these lethal weapons. When non-sate actors use it, it is termed as bioterrorism (Wheelis, et al., 2006, p. 284-293, 301-303).

Biological weapons take certain incubation periods to be effective fooling opposite forces who cannot guess the bioweapons' release even it is imposed upon them. It is even more critical when biological agents like smallpox, pneumonic plague transmit man-to-man through aerosolized respiratory droplets and causes virus contamination to both enemy, neutral and innocent people, even closed friendly collaborators.

2. Materials and methods

Research methods entirely include qualitative design which discusses on the argumentation, and observations analyzing the data, driven from authentic ancient literatures to modern-day scientific researches, journals, and and surveys publications.

Like most qualitative researches, the paper also contains some statistical presentation so that the axiom can be strengthened. Secondary data outputs decent analytical understandings based on observed interpretation of documents, and literature from

related number of journals, books newspapers, university libraries (e.g. BUET Library, National Library etc), medical (WHO Library of Bangladesh, BIDS Library, and UNIC Library etc), and military institutions. Besides, online resources from number of related websites, e-journals, e-newspapers provided large amount of data, and information.

Finally, biological weapons is a multiple concept involving number of academic disciplines. as an interdisciplinary study, Peace and Conflict Studies greatly helped me to complete-done the work.

3. Results

The paper conspicuously brings three developing chapters of biological weapons, unlike many issues, mainly focusing on public health security for entire human race. The paper, firstly proves that ancient war-strategy of biological weapons still survive today under changed forms and so-called research purposes of hegemonic powers. Recreation of extinct viruses one by one through 'Reverse genetics' and then, their genetic modification clarifies the ill motives of such Biological Researches. Stockpiling lethal bioweapons not only strengthen defense strategy rather, send a message to the rest of the world that no state even shouldn't dare to attack against them. with the development of sophisticated microbiology and virology, the research and production of such viral Weapons of Mass Destruction seem to be very easy tasks. Tensions grow here on non-state actors and individual groups who are very likely to access these bioweapons. Unlike chemical, conventional, even nuclear weapons, biological weapons act like silent aggressor as it contaminates through number of pandemic diseases and continue, and manipulate through natural reproduction, and adaptation capabilities. Authority may find out mortality-reason when it is too late and so, deliberate contamination remains covert as assassinations.

The paper finally signals about a deadly future where biological weapons tend to dominate most of the wars.

3. Discussion body

3.1 Historical development of biological weapons

3.1.2 First Phase: Ancient Era (600 BC-1763 AD)

Use of Biological Weapons (BW) date back to its ancient practices (Mayor & Adrienne, 2003). For instance, Assyrians poisoned enemy wells with the fungus during the 600 century BC, which caused psychosomatic illness and Scythians archers infected their arrows with blood and flesh of cadavers during 400 BC (Hooker, 2012). Ancient literature quoted that infected animals were used to poison enemy wells in 300 BC. In 190 BC, Pergamon (Greece) king Eumenes II was defeated

by Carthaginian (presently Tunisia) commander Hannibal in a Naval battle of Eurymedon (now at Turkey) as Hannibal threw venomous snakes into the enemy ships. In 12th century AD, Holy Roman Emperor Frederick Barbarossa used soldiers' cadavers to contaminate enemy water sources during the battle of Tortona (now at Italy). In 1346, during the siege of Caffa seaport (now feodosia, Ukraine), Tatar forces (nomads of Mongol empire) were infected by epidemic plague diseases during the siege of Crimean city Caffa. They turned their misfortunes into successful war-strategy when they hurled Plague-infected Mongol corpses into the boundaries of enemy city and later on, these are speculated that it was escalated 'black deaths' in Europe, Near East and, North Africa during 14th and 15th century resulting in most public health disaster in the history killing approximately 25 million Europeans (Wheeler and Mark, 2002; Robertson & Robertson, p. 1995;160:369–373). In 1710, Russian also used this viral strategy to Swedish troops in a fight at Reval battlefield, Estonia (Hooker, et al., 2012).

In 1789, British Marine forces used smallpox germs in New South Wales (Christopher & Warren, 2013). Pandemic Smallpox, another biological weapon was used during Pontiac's War (1763-66). During French-Indian War (1754-1767), British force commander in North America Sir Jeffrey Amherst ordered for the indiscriminate use of smallpox to decline the number of Native Indian population who confronted British rule there (d'Errico, 2001, 2011).

Amherst's subordinate officer, captain Ecuyer intentionally distributed smallpox-contaminated blankets from hospital to Native American in 1763 (Eitzen & Takafuji, 1997, p. 415–423; Robertson & Robertson, p. 1995;160:369–373). This inhumane plan what Ecuyer himself commented, 'I hope, it'll have the desired effects' (and he was right), which resulted in massive smallpox pandemic among Indian tribes in Ohio River Valley. Smallpox infected civilians were sent to the Continental Army during American Revolutionary War (MacKenzie, 2011).

3.1.2 Second phase: World War I and World War II (1914-1945)

With the development of microbiology, during 19th century the production and stockpiles of specific pathogens started to increase many times.

Germany initiated covert operations during World War I. Imperial German government applied germ theory and bacteriology in World War I (1914-1918) creating a level of sophistication in warfare. Germans transported horses and cattle infected with Anthrax and Glanders germs to USA, France, and other countries (Stockholm International Peace Research Institute, 1971). Romanian sheep were infected with the same viral agent to export in Russia. Germany initiated cholera in Italy and

plague in St. Petersburg in Russia (SIPRI, 1971). Under the supports of Nazi officials, German virologists infected Rickettsia, hepatitis A, and Malaria viruses. However, Germany denied all these allegations.

During World War II, UK Ministry of Supply weaponized tularemia, anthrax, botulism, and brucellosis toxins through ranges of Biological Weapons Research programs under the supervision of microbiologist Paul Filders at Porton Down. Later in the period of 1942-43, a series of extensive test on Anthrax were conducted in Scottish Gruinard Island and the viral reaction continued there for the next 48 years (Prasad, 2009; Manchee & Stewart, 1988, p. 24:690-691). Moreover, British imported West African infected mosquitoes in an endeavor to spread 'yellow fever' into India (Eitzen & Takafuji, 1997).

Under the direction of Shiro Ishii (1932-42) and, Kitano Misaji (1942-45), Japanese biowarfare army, Secret Imperial Japanese Army Unit 731 conducted a controversial research on Biological Weapons (BW) resulting in fatal human experiments upon 10000 prisoners, opponent soldiers (Korean, Chinese, Mongolian, Soviet, American and, Australian), and innocent civilians under the supervision of 3000 scientists and then, used it in the battlefield of Manchuria, China during 1932 and continued so till the end of WW-II (Eitzen & Takafuji, 1997, p.415-423; Harris, 1994). The Imperial Japanese Army Air Force bombed biological explosives containing germs of bubonic plague, gas gangrene, anthrax, syphilis, meningococcal, cholera and, dysentery in Ningbo, China, which gradually contaminated and then killed approximately 400000 people indiscriminate of civilians and soldiers during 1940s (Barenblatt & Daniel, 2004). Later on, Japanese army itself considered the operation as 'most regrettable from the view point of humanity'. In 1942, Biological weapons sabotaged at least 1,700 Japanese Imperial Army soldiers by their bioweapons during the Zhejiang-Jiangxi Campaigns in China (Eric Croddy, et al., 2004, p.171).

Later on in 1950s, US, UK and, USSR undertook sophisticated researches on BW during cold war. Britain weaponized viruses such as plague, brucellosis, tularemia, equine, encephalomyelitis and vaccinia viruses and on the other hand, US Army Biological Warfare Laboratories weaponized anthrax, tularemia, brucellosis and, Q-fever etc. Racing with other countries, In 1942, US Civilian Agency directed War Reserve Service to conduct offensive biological warfare program at Camp Detrick, Maryland which is known today as the US Army Medical Research Institute of Infectious Diseases (USAMRIID).

3.1.3 Post World War II (1940s-present)

In post WW II period, the Soviet Union, China, and North Korea alleged the USA for using biological agents in Korean Peninsula War (1950-1953). These countries felt imbalanced weight in international relation as USA established defensive program in Pine Bluff, Arkansas which developed biological arsenal--bioagents, pathogens, toxins, fungal to induce crop failure and famine (Riedel, 2004).

During late 1970s, helicopters and planes sprayed multi-colored aerosols (notorious 'Color Rain') and indiscriminately released wild and toxic honeybees over the inhabitants of Laos and Kampuchea. 'Viet Cong Guerillas' of Vietnam War used needle-sharp stick, Punji causing severe infections to the enemies. During the age, covert assassination increased to the terrific numbers. Rumor suspects is there any biological contamination on the deaths of legendary global leaders, e.g. Yasser Arafat, and Hugo Chávez etc. Poisons killed Bulgarian exile, Georgi Markov in London in 1978 and later on it was known as 'umbrella killing' because the virus-containing tiny pellet was disguised in umbrella (Frederick & Detrick, 2001).

As a leakage of secret operation, an anthrax epidemic broke out among local residents in Russian city of Sverdlovsk who worked and lived near Soviet Military Microbiology Facility (compound 19) and later on, Russian President Boris Yeltsin acknowledged the outbreaks as accidental release of anthrax spores in 1992 (Reaching Critical Will, 2011).

The secret and unauthorized uses of biological agents spread very soon in the US. For instance, in 1984, intentional contamination (Salmonella typhimurium) of Salad bars in Rajneeshees Restaurant, Oregon hospitalized 45 victims. As sequential events, USA and allied countries posed threats of biological weapons to be used in Persian Gulf War in 1990 and initiated probable biowarfare security measures of immunization, decontamination, masks, education facilitation, and combating training and so on. During 1985-1991, Iraq developed offensive biological weapons capabilities with anthrax, botulium toxin, and aflatoxin. In 1995, bioterrorism appeared in scene for the first time when Aum Shinrikyo (Japanese terrorist group, now its Aleph) organized a subversive operation in the Tokyo subway with Sarin gas and later on, the religious cult made three unsuccessful biological attempts with Anthrax, Ebola virus and, Botulinum toxin (Riedel, 2014).

3.2 Biological Weapons:

Biological Weapons (BW) include ranges of infectious agents such as viruses, bacteria, fungi (living microorganism) and, plant or animal-driven toxins and poisons (chemicals) which are used intentionally for contaminating or infecting target people, animals and plants in a battlefield (Terrorism Files).

Biological weapons or germ weapons refer to a number of disease-producing agents (bacteria, viruses, fungi, rickettsiae, and toxins) which may be utilized as weapons against humans, animals, or plants (Schneider, 2014).

Biological warfare deliberately spreads diseases amongst humans, animals, and plants inflicting bacteria or viruses into an environment for hostile motives. As victims cannot defend the viral contamination, the agents turn into effective weapon at killing plants, livestock, pets, and humans. It involves a huge variety of both traditionally and genetically modified bacteria and viruses to withstand antibiotics (Reaching Critical Will).

Biological warfare agents include number of bacteria and virus of anthrax, brucellosis, and typhus that causes diseases such as equine encephalitis, fungi; fungi such as rice blast, cereal rust, wheat smut, and potato blight; and toxins such as botulinum and ricin that are extracted from living organisms (Merriam Webster, 1946).

3.3 Today's sophisticated bioweapons tend to wipe out human race

Within 2045, Insects, germs and, hybrid weapons (composed of germs and machine) may initiate biological and environmental warfare causing unprecedented damage to human hygiene (even mass death), plants, harvests, pets and cattle across the globe (UK Ministry of Defense, 2014). The next generation US military forces require to be enough immune against bioweapons, said Defense Advanced Research Projects Agency-DARPA (Sinha, 2014).

3.3.1 US under covered laboratory researches

Recently in July 01, 2014, six types of forgotten smallpox vials were discovered at an unauthorized government building, National Health Institute (NHI) in Bethesda, Maryland, USA. US Food and Drug Administration use the building since 1972. US Centre for Disease Control and Prevention (CDC) and international scientists are absorbed in immense tensions about its possible outbreaks of six newly invented germs. Therefore, Federal Bureau of Intelligence (FBI) and Centre for Disease Control and Prevention (CDC) have scheduled together to investigate the accidental release of the germs. Earlier in last month, Anthrax germs were accidentally released in a lab at CCD in Atlanta and the agency gave scores of antibiotics to their employees as precautions (Fox news, 2014). How can state manage if the vials spread out in public?

World Health Organization (WHO) declared the eradication of Smallpox disease in 1980 except two protective places in Russia (Novosibirsk, Siberia) and USA (CCD lab in Atlanta). Unfortunately, this is the third place where typical smallpox agents was discovered for the first time and world

scientists society suspect that there might have many places having such or other kind of viral agents.

US stockpiles dangerous smallpox samples from Japan, Netherland, and Britain. There are two schools of virologists who favor or oppose the preservation of these deadly viruses. One believe these viruses are quite necessary for research and better treatment, modification, and updating the vaccinations, On the other hand, these viruses should be immediately destroyed to the end from the planet for the chance of accidental and deliberate release of the germs (Daily News, 2014).

During May 2014, two notorious lethal viruses having death potentialities spread out. Middle East Respiratory Virus (MERS) has appeared in the US and 240 cases of Ebola contamination are reported in West Africa, which caused about 136 deaths there. Fortunately, these two viruses are not sufficiently transmissible to cause pandemic outbreaks. Think about the results, which could be dangerous if lab scientists genetically modify these viral agents for biological weapons and then released in hostile public. May be these contaminations can be deliberately occurred because non-state actors and terrorists groups are frequently alleged of producing, stockpiling and releasing these weapons. Health and security challenges are that there have found a trend of weaponization of these deadly viral agents (Barrett, 2014).

In 2013, US involved in a bioweapons scandal in former Soviet republic, Georgia. The Richard Centre for Public and Animal Health Research in Tbilisi, Georgia experimented ranges of cholera and other deadly viruses there (Barrett, 2014).

Most deadly viruses so far invented in 2009, Wisconsin University Professor Yoshihiro Kawaoka recreated an extinct influenza virus --97 percent similar to 1918's 'Spanish Flu' from an avian flu's eight genes fragmentations found in wild duck through a controversial experimentation (reverse genetics) to show its easy reemergence today by infecting laboratory ferrets. Scientists think this genetically engineered virus may cause deadly influenza pandemic if it outbreaks either accidentally or deliberately because it killed at least 50 million Spanish people in 1918. According to Daily Mail, this H5N1 virus can' wipe out 400 million people' (Walters, 2014). Moreover, this destructive professor also conducted a research on the transmissibility of H5N1 deadly strain of influenza virus. Alfred Noble invented dynamites for peaceful purposes and we see how it threatens to global peace and security. Harvard University professor Lipsitch commented scientists should not take such risky activities, even at a safest lab without finding strong evidence that these researches or inventions can save human lives. Harvard Medical School microbiologists Robert Kolter said that self-aggrandizement engages such

scientists who are completely blind to irresponsibility doing these acts (The Independent, 2014).

3.3.2 Middle Eastern battlefield develops and stockpiles bioweapons

Syrian President Bashar Al Assad develops anthrax and other viral agents at two biological weapons bases in subterranean and coastal location (Times of Israel, 2013). In 2013, fearing that it might fall into the hands of Shi'ite terrorist group Hizballah, preemptive Israeli airstrikes targeted Syrian Biological Weapons research centers Jamariya, northwest Damascus (Klein & Vick, 2014).

US Secretary of State John Kerry alleges Assad having stockpiles and sites of biological weapons--smallpox viruses. Syrian foreign minister Jihad Makdissi responded that they would never use bioweapons concerning the health security of government and military forces and thus he confirmed Kerry's allegation of existence of biological weapons. Through an unclassified report, US Director of National Intelligence James Clapper confirmed Syria's biological warfare program in March 2013 at Scientific Studies and Research Centre (SSRC) in Damascus, Aleppo, and Homs and the possibilities of health hazards increase as Syria has not ratified Biological Weapons Convention (BWC) and have the chances to use BW in remote population (The Telegraph, 2014).

It is suspected that Syria may collect smallpox strains from its last most natural outbreak in 1972, even it may get Genetically Modified versions from North Korea in 2006 (Aalst & Guitta, 2013).

The development of genetic weapons or ethnic bioweapons tends to escalate with the advancement of scientific knowledge. In 2005, International Committee of the Red Cross said that number of independent and government experts acknowledges the potentialities of ethnic-targeted weapons are not so far off. The American Think Tank PNAC urges US government to rebuild America's defense with a view to coping up with advanced forms of biological warfare of ethnic bioweapons, waged by terrorists and counter political powers (Aldanyh, 2013).

Since 1998, Israeli scientists are working secret to invent ethnic bombs, which would be able to target particular ethnic races in Arab countries not Jews, said Sunday Times. Israeli scientists try to identify distinctive genes which Arabs contain, and then to create genetically modified bacterium or viruses effective to the particular genes. These covert researches were conducted at the Institute for Biological Research at Nes Tsiona, Tel Aviv (Weber, 1998).

The World Health Organization declared a warning to doctors around the world about a new SARS virus which tends to attack specific Arab races.

This new Arab-specific SARS virus causes kidney failure unlike its old form that causes respiratory diseases. Arab, specially the Mecca is a risky place for global contamination in terms of pilgrimage gathering as tens of thousands of devotees appear there across the world to perform Haj. Therefore, deliberate contamination of these viral diseases may spread out global health hazards.

Suspicions involve Israeli covert research on race-specific bioweapon, which tends to commit a massive ethnic cleansing in Arab world through genetically engineered bacterium. Israeli defense at Porton Down assured that these kind of ethnic bombs are possible and Israeli microbiologists and virologists have successfully traced out genetic profile of Arab communities putting specific emphasis on Iraqi people. British Medical Association appreciated Israeli endeavors terming it as more effective war strategy than conventional weapons (Susanne Posel, 2013).

3.3.3 North Korea

Out of nuclear and conventional weapons' debates and disputes regarding North Korea, this militarized country stockpile a threatening amount of biological weapons which can outbreak ranges of retaliatory warfare with the West. Pyongyang's bioweapons also pose a dangerous threats for North Korea because any unintentional release of devastating bioweapons can vanish the country within two weeks (Laaneots, 2014).

Global intelligence agencies from Russia, USA, Britain, and South Korea identify sites across North Korea dedicated to the production of biological weapons (Miller, 2011). In 2010, South Korean Defense Ministry apparently termed North Korea having acquired production capabilities of anthrax, smallpox, and cholera viruses, but the ministry remains uncertain on the weaponization of these viruses through testing on political prisoners (Nexon, 2013).

Ken Alibek, Former Head of Russian bioweapons agency, 'Biopreparat' claimed that North Korea had created lethal black pox, hybrids of smallpox and Ebola virus. US and Russian intelligence services mark North Korea having medium grade intelligence which might let them for the invention of smallpox because aftermath of the Soviet union's collapse, some number of Biopreparat scientists may have moved to North Korea. International Institute on Strategic Studies alleges that North Korea is able to produce nerve, choking agents, blood, blister, bubonic plague, anthrax, cholera counting its stockpile at 2,500 to 5,000 tones (Serfas, 2013).

North Korea along with Iran, and Syria Russia tends to develop more dangerous biological weapons ever. Only Iran is alleged to develop anthrax, Ebola, encephalitis, biological toxins, severe acute respiratory syndromes (SARS), smallpox, plague, and cholera. Under the

assistance of North Korea, Iran has genetically altered smallpox agents for making current vaccines ineffective. Unlike biological, Chemical and radiological weapons, the living organism of biological weapons assume to be highly transmissible and infectious. For lengthy incubation period, sometimes detection of these viral outbreaks seems to be difficult. These silent pandemics go beyond the medical countermeasures when these vials and germs are genetically altered and weaponized. Iran's powerful military regime apply deceitful measures to conceal the constant development of viral arsenal which may cause tens of millions of deaths (Aalst et al., 2013).

4. Bioterrorism

Bioterrorism refers to intentional release (by non-state actors) of viruses, toxins, bacteria, fungi, and other agents, which cause calculated deaths and damages to people, animals, and plants. Bioterrorism started to increase when anthrax-contaminated letters were mailed through US postal services in 2001. This deliberate anthrax contamination killed five people out of 22 affecteds emerging a widespread fear in USA, and Chili etc (Rose).

US Centre for Disease Control (CCD) identifies bioterrorism agents into three categories.

First category includes highly prioritized and rare bioagents, which pose threats to entire national security. These agents are able to easily disseminate and transmit from person to person resulting in high mortality rate as a major public health pandemic, public panic, and social disruptions. Therefore, it crucially requires for public health preparedness.

Secondly, it gets second highest priority for its moderate transmissibility, moderate mobility, and lower mortality rate. The category requires specific enhancement of diagnosis capacity, integrated disease surveillance mechanisms.

Final category involves emerging agents, bioweapons that have potentiality to be genetically altered for mass dissemination as it thinks to be available and easily producible, For Instance, threatening future category such as Nipah virus etc (Clark, 2014).

Intelligence analyst Andrew O'Neil identifies three reasons for terrorists to choose biological weapons for occurring subversive operations (Australian Journal of International Affairs, 2003).

Firstly, biological weapons are easily acquirable than nuclear weapons and occur the same killing impacts as Weapons of Mass Destruction (WMD) does. **Secondly**, No counter measures deem to be able to tackle genetically modified and weaponized biological weapons at the time it outbreaks until the vaccines are not accordingly updated. **Finally**, Biological weapons are living microorganism

which reproduce, and adopt as circumstances change.

Iran and Syria undoubtedly patronize non-state actors, terrorists in the Middle East. These two countries are strongly alleged of having variations of such deadly biological weapons, which have been developed through their domestic programs of extensive medical and pharmaceuticals research and development structures beneath the untraceable safety measures. Having shared artillery, ballistic missiles and munitions technology, Iran likely assist Hezbollah to deliver such pathogens (Aalst, et al., 2013).

5. Biological Weapons Convention (BWC)-1972

The convention (as a supplement of 1925's Geneva Protocol) was signed at Washington, London, and Moscow on April 10, 1972 which imposes prohibition on the development, production, and stockpiling of biological, and toxic weapons. The statutes assume to be biblical verses, actually, the convention abstains small powers to acquire biological development for any purposes and under the table, the convention allows super powers to continue comprehensive researches on biological weapons program.

The convention with 15 articles focuses on the following issues (United Nations Office for Disarmament Affairs-UNODA).

Biological weapons never be acquired under any circumstances.

Prior to the joining, states must destroy bioweapons, and associated resources or divert to the peaceful purposes.

Transference, assistance, inspirations or provocations to any state or anyone to acquire biological weapons are completely prohibited.

Sates are urged to take national measures for the implementation of BWC provisions on domestic grounds.

Bilateral and multilateral consultations to solve any problems for implementations of BWC provisions

Sates will request the UN security Council to investigate the alleged violation of BWC provisions and urge for subsequent punishment accordingly.

Assistance to the bioweapons-exposed states

Peaceful uses of biological science and technology

Critiques find the convention as frequently violated in previous times. Soviet Russia being a state party the convention, continued ranges of offensive biological weapons, even after it ratified the convention in 1975 among 170 state parties, except major state, Israel only.

Russia trashes the allegation saying that it was terminated long ago but the question arises about

what happened to the stockpiling bioagents. The treaty fails to ban the ongoing development of biological weapons as during 1990s' Persian Gulf War, UN Special Commission found Iraq still developing biological weapons program violating its treaty commitment. In 2001-2002, United States accused Iraq, North Korea, Iran, Lybia, Syria, and Cuba for their covert biological weapons development programs breaching the convention (Kimball & Meier, 2012).

6. Biodefense and public health preparedness

In order to ensure biosecurity or biodefense, and public health preparedness, counter measures involve (Thompson, 2001).

Introducing early alert system for both public health officials and civilians en masse

Establishment of mass or overflow patient care system including both auxiliary and temporary treatment facilities

Training to local medical staff to identify disease symptoms and enable them for proper treatment, at least, first aid and information dissemination about what to do

Developing competency standards for physicians, paramedics, and nurses for emergence care during mass casualties as emerged by Weapons of Mass Destructions (WMD)

Guidelines on in-hospital decontaminations and medical practices with contaminated patients

Providing mass immunizing drugs during bioterrorism acts for 'already exposed' and 'to be exposed' populations in the contaminated environment

Preparing national pharmaceutical stockpiles of vaccines and drugs

Respectful and safe dispositions of the deceased (both humans and animals) during mass fatality

Early infection control in shortest possible time and risk assessment of the level of contamination to ensure reentry of potentially contaminated zones

Mass production and enlarging stockpiles of antibiotics with required updates

To review and update mass casualty treatment protocol

Legal aspects of biodefense include following measures (DaSilva, 1999).

Adopting proper national laws to criminalize or ban the production, transfer, use, and stockpiling biological weapons

Enactment of existing national laws to monitor the production and development of biological weapons

Forming national and international databanks to investigate the use of bio agents in industries under

the given licenses of national, regional and, international organizations

Using confirmatory protocols for the destruction of illegal biological stockpiles

Global field investigation and surveillance through World Health Organization (WHO) and UN mechanism against alleged biological weapons development program

Fixing code of conduct for scientists who work with the lethal pathogens

Concerning transnational bioterrorism and global health security, three general (strategic, tactical, and personal) types of protection measures to be discussed here (Lerner, 2003).

Strategic defense consists of international cooperation. In 2001, the US and NATO reached a treaty of 'collective security' commitment stating that attack against any member state with Weapons of Mass Destruction (WMD) including bioweapons must be taken as attacks against all NATO states.

Tactical measures consist of application of set of devices and measures to detect or eliminate threats of bioweapons. For instance, thermal fuel -air bombs which the US used to destroy the facilities of bioweapons-making factories in the Gulf region during 1990s (Lerner, 2003).

Large-scale military responses aim at the protection against largest, identifiable, and targetable enemies home and beyond. These comprehensive military actions fail to address number of people who occur bioterrorism in a clandestine way. A typical house can produce as many anthrax spores as a standard American lab produces. Therefore, security agencies and intelligence networks stress on surveillance in every structure, even if curtails little individual liberties.

Preparedness against biological weapons requires national government apparatus, local government agencies for the engagement of two certain phases of security initiatives such as pre-attack and post-attack etc. Biological securitization involves comprehensive and integrated approach of military forces, ministry, intelligence community, and first responders.

Pre-attack

Pre-attack preventive measures involve both defensive and offensive strategies along with political maneuvers to increase confidence and stability among vulnerable or victim populations. Pre-attack defensive measures tend to increase security of target places or operation venues, for instance, Heating, Ventilation, and Air Conditioning (HVAC) system of a target building or architecture, food possessing zones and water storage and purification sites. Defensive mechanisms consist of strong monitoring and imposition of restrictions on the sale and exchange

of required equipments to create biological weapons through microbiological engineering (Lerner, 2003).

On the other hand, offensive measures involve military and intelligence community to prevent attacks disabling terrorists' use of biological weapons. As once biological weapons released, situation goes beyond control with massive health hazards. Therefore, Excellent intelligence and constant spy-activities play a crucial role on marking potential groups who seek scopes to use bioweapons, and the place where these weapons are kept covert. With the bioweapons detected, states may initiate either political maneuvers or preemptive strikes on suspected objects and groups to wipe out arsenals.

Post-attack

Due to delay and difficulty to detect the production sites and initial release of biological weapons, it requires comprehensive post-attack scenario under clear and coordinated response plans causing as much as minimum mortality rate. Effective post-attack strategies consist of early detection of biological weapons attack (both preinfection, and postinfection). Preinfection detection strategies refer to sophisticated censoring or monitoring of ground, water, air, and food (Lerner, 2003).

7. Conclusion

Biological weapons existed and will remain so as by-product of sophisticated microbiological evolution. Inter-state transparency, trusts, power balance likely to lead the states for a minimum most biological weaponization. Big powers' avuncular behaviors and constant war impositions tend to give rise a number of non-state actors of insurgency and terrorism.

Comprehensive investigation and surveillance mechanisms under national and global security forces and intelligence organizations successfully reduce and monitor covert biological weapons development program. The Biological Weapons Convention must be reformed and strong enough for ensuring transparency on research labs in particular states. As a supreme International Organization, United Nations (UN) has to monitor or investigate biological development programs in developed countries so that it is used in vaccine and medicine development motives.

Finally, states have to undertake both pre and post security measures as described little earlier.

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