

BIOTERRORISM, PUBLIC HEALTH AND NATIONAL SECURITY

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Abstract

The possibility of terrorist groups utilizing biological weapons against states and countries is a mounting concern which has increasingly attracted the attention and resources of the world. This study sets out to examine the issue of biological terrorism and its potential threat to public health and national security. This was achieved using baseline information and data generated through related reported studies. Bioterrorism was found to be an 'entirely possible', potent, emerging threat to public health, national and international security leading to public health emergency, intimidation of the affected governments and national security vulnerability. Overcoming these challenges calls for the introduction and implementation of new, effective, potent, practical and workable plan and strategies to enhance preparedness, early detection, rapid investigation and quick response in order to stem its devastating effects among human population, animals and environment.

Keywords: Bioterrorism, Biological Weapons, Public Health, National Security.

Introduction

Prior to the 20th century, terrorist groups hijacked planes and attacked government infrastructures by using explosives, bombs or small arms. In the 20th century the packaging of improvised explosive devices (IED) took a new turn with the use of used bottles, soft drink cans and shoes, to the use of person-borne IEDs (PBIED), suicide vehicle-borne IEDs (SVBIED), vehicle-borne IEDs (VBIED), surgically implanted IEDs (SIIED) (JEEP, 2009; JFOB, 2009; Kimery,2009; Mackay,2011; Klaidman,

2012; Burleigh, 2013; Aque,2013). New intelligent reports indicate terrorist groups' quest for biological agents and many countries pilling up bioweapons (Galamas, 2011; Grundmann, 2011; MEMRI, 2014).

Some of these terrorist groups are Abu Nidal Organization (ANO), Aum Shinrikyo (AUM), Basque Fatherland and Liberty (ETA), HAMAS, Hizballah, Kurdistan Workers Party (PKK) (Kongra-Gel), Liberation Tigers of Tamil Eelam (LTTE), National Liberation Army (ELN), Palestine Liberation Front (PLF), Palestinian Islamic Jihad (PIJ), the al-

Qa'ida (AQ), Islamic Movement of Uzbekistan (IMU), Real Irish Republican Army (RIRA), Al-Aqsa Martyrs Brigade (AAMB), al-Qaida in the Islamic Maghreb (AQIM), Jemaah Islamiya (JI), Ansar al-Islam (AAI), Libyan Islamic Fighting Group (LIFG), Islamic State of Iraq and the Levant (formerly al-Qa'ida in Iraq), al-Shabaab, al-Qa'ida in the Arabian Peninsula (AQAP), Tehrik-e Taliban Pakistan (TTP), Haqqani Network (HQN), Boko Haram, Ansar al-Shari'a in Tunisia (also in Damah, and in Benghazi), al-Nusrah Front, Mujahidin Shura Council in the Environs of Jerusalem (MSC) (DOS, 2015).

Attack with biological weapons which before was considered very unlikely now seems entirely possible. Many experts believe that it is no longer a matter of 'if' but 'when' such attack will occur. An attack with such bioweapons such as small pox, polio, etc. could easily culminate in national or international public health and security emergencies (Cordell and Wolff, 2009; Lillibridge, 2000).

Over 17 countries are known to have biological weapon programmes with different microbe stocks. This technology however, seems to have passed into terrorists' hands and could be used for the act of bioterrorism (Borio *et.al.*, 2002; Shahnawaz, 2010). Military bioweapon programmes have been reportedly discovered in Iraq and the former Soviet Union (CDC, 2004).

This situation could 'diffuse'. The term 'diffusion' refers to the spread of instability from one geographic area to another. The original conflict may be sub-national, national, regional and/or international in nature. Diffusion of

conflict can take place internally within or externally beyond the geographic boundaries of the original conflict country or region. Diffusion could also apply to the intensity of the conflict which could be in descending or ascending concentration (Cordell and Wolff, 2009).

In the theory of diffusion of war, Silverson and Starr (1991) argued that the 'contagion' of war or how and under what circumstances conflict grow and what war causes is just as important as what causes it. They concluded that conflict with bioterrorism inclusive could undergo the process of escalation which could diffuse to become more concentrated or vice versa depending on how it is handled (Silverson and Starr, 1991). Bioterrorist attacks definitely pose a threat to public health and national security in ways different from any other treat ever faced by the world. This is indicative by the high number of casualties and deaths recorded all over the world in different terrorist attacks and the promise by terrorist groups to inflict more losses on target populations (CDC, 2004; Alakpa, 2013). The objective of the study is to make information on bioterrorism available in the public domain thereby creating awareness and keeping the citizenry informed.

Bioterrorism

Bioterrorism is the intentional/deliberate/unlawful release or threat of release of harmful biological weapons in the form of viruses, bacteria, fungi or their toxins, in order to cause disease or death among human population, animals and plants (Ashford, 2003). The aim is to 'terrorize', intimidate or instill

fear in civilian population and the government; manipulate or coerce the government and society in addition to creating publicity for the terrorists or groups. (Annas, 2002; Das and Kataria, 2010; Alakpa, 2015). It could also be described as an act of war (Ashford, 2003; DDD, 2011).

Although, nuclear arms have great killing ability, they are difficult to acquire. Chemical weapons on the other hand are easier to get but lack great killing capacity. Biological agents, however, have both qualities; unequaled destructive potentials and ease of acquisition which make them attractive to terrorists (Shahnawaz, 2010).

Bioweapon

Biological weapons are biological agents which include viruses, bacteria and fungi and their toxins employed to launch bioterrorist attacks (Das and Kataria, 2010). Although these terrorist attacks could be caused by virtually any pathogenic microorganism, to be affective however, the microorganism should consistently produce a given effect, disease or death at low concentrations. It should be highly contagious and have short and very predictive incubation period. The target population should have little or no immunity against the organism. The agent should be amenable to economic mass production and be difficult to identify in the target population with little or no prophylaxis or treatment available within the native population (Das and Kataria, 2010).

Availability of multiple agents and delivery means, variable incubation periods, high mortality rates and potentials for geographic dispersion of the agent

during the incubation period are other challenges presented by biological agents that qualify them for use as weapon (Das and Kataria, 2010).

These agents are typically found in nature but it is possible that they could be changed to increase their ability to cause disease, make them resistant to antimicrobial agents or increase their ability to spread into the environment through the air, water or food (CDC, 2007).

Bioterrorism agents can be of three (3) categories, depending on the ease of spread and the severity of disease or extent of fatalities. Category A agents are considered the highest risk, category B ranked next while category C agents are those that are considered as emerging threats for disease (CDC, 2007).

Category A consists of high priority agents and are easily disseminated / spread, causing high mortality, public panic and social disruption. They require special action for public health preparedness. Examples are *Bacillus anthracis* (anthrax), *Clostridium botulinum* toxin (botulism), *Francisella tularensis* (tularemia), *Variola major* (small pox), *Yersinia pestis* (plague), Ebola disease virus (ebola virus disease), Lassa virus (Lassa fever), Polio virus etc. (CDC, 2007; Das and Kataria, 2010).

Category B agents are the second highest priority agents; they are moderately easy to disseminate, cause moderate mortality and require enhanced disease surveillance and public health diagnostic capacity. Examples are *Vibrio cholera* (cholera), *Shigella dysenteriae* (shigellosis), *Salmonella* species (salmonellosis), *Escherichia coli* (colibacillosis), *Cryptosporium parvum* (cryptosporidiosis), *Staphylococcal*

enterotoxin B, Ricin toxin from *Ricinus communis*, *Burkholderia mallei* (glanders) etc. (CDC, 2007; Das and Kataria, 2010). Category C are the third highest priority agents. They include emerging pathogens that could be engineered for mass dissemination in the future, having potentials for high morbidity, mortality and major health impact. Examples are Hanta virus, Multidrug resistant tuberculosis, Yellow fever, Nipah virus, Tick borne encephalitis virus, Tick borne hemorrhagic fever virus etc (CDC, 2007; Das and Kaatria, 2010).

The list of microorganisms and their toxins identified to be candidates for biological weapons continue to expand with the discovery of newer agents either occurring naturally or through human manipulation via laboratory genetic synthesis (Alakpa, 2013). All of which can be used by extremists as bioweapons for bioterrorism against civilian populations and nations (Capriappa *et al.*, 2002; Das and Kataria, 2010).

History of Bioterrorism

Bioterrorism is one of the oldest tactics in warfare (Richards, 2000). It is ancient dating back to 4th to 6th centuries BC (Eitzen and Tokofuji, 1997). Many years ago, armies knew that throwing corpses and dead animals into enemies' drinking water supplies was an effective way to limit the progress of an invading force (Robertson and Robertson, 1995; Richards *et al.*, 2000). Polluting wells and other sources of water of opposing armies was a common strategy that continued to be used through the many European wars, during the American civil wars and also in the 20th century (Riedel, 2004).

Catapults were used to throw plague victims over enemies' city walls or plague victims' excretions were poured on troops trying to scale castle walls. The strongest weapon used by European invaders to subdue indigenous people was communicable disease without which victory would have become more difficult (William, 1976). Warriors also substituted ancient war tools for biological agents (Richards *et al.*, 2000; Kostadinova and Galanova, 2010).

Snow later worked out the mechanism of cholera transmission through drinking water while Koch formalized the postulates of infection by infectious agents leading to better understanding of infectious diseases, making the use of biological warfare more sophisticated (Robertson and Robertson, 1995; Richards *et al.*, 2000).

In modern time, bacterial and viral agents can be easily cultivated. While many are ubiquitous in the environment and are easily isolated, others are difficult to find and the commercial sources are greatly monitored but a bridge in security anywhere in the world can make the agents land in the hands of terrorists since they are easy to ship and exchange (Richards *et al.*, 2000).

Evidence suggests the existence of an ambitious biological warfare programme in Germany during World War I. The Germans were reported to have attempted to ship horses and cattle inoculated with disease producing bacteria such as *Bacillus anthracis* (anthrax) and *Pseudomonas mallei* (glanders) to USA and other countries, the same agents were used to infect Romanian sheep designated for export to Russia. They also attempted to spread cholera to Italy and plague to

Russia. It was alleged that they dropped 'biological bombs' over British positions (SIPRI, 1971; Hugh-Jones and Wickham, 1992).

During World War II, many countries were reported to begin ambitious biological warfare research programme. Japan conducted biological weapon tests from 1932 till the end of the war under the direction of Shiro Ishii and later Kitano Misaji. More than 10,000 prisoners were believed to have died as a result of experimental infection between 1932 and 1945 (Haris, 1994).

Also during the post World War II, some countries embarked on bio warfare programmes. During the Korean War, the Soviet Union, China and North Korea accused the USA of using biological warfare against North Korea (Eitzen and Takafuji, 1997; Manchee, 1988). It was reported that by 1960s, the US military had developed a biological arsenal that included numerous biological pathogenic toxins and fungal plants that could be directed against crops to induce crop failure, famine and ultimately affect national security (Eitzen and Takafuji, 1997).

Many other countries like Canada, Britain, France and defunct Soviet Union are reported to still continue with their biological weapon research (Robertson and Robertson, 1995; Carter, 1992).

Bioterrorism and Public Health

There are various reported cases of bioterrorism which have different implications for public health all over the world.

A fungus, *Claviceps purpurea* with the mycotoxins inside the rye ergot was reported to have been employed by

the Assyrians to poison the wells of their enemies. The Greeks were reported to employ a purgative with cardiac glycoside effects to poison the water supply when they attacked the city of Krissa (Wheelis, 2002).

During the siege of Kaffa, (now Feodosia, Ukraine) by the Tartar army in 1346 and the Russians' onslaught against the Swedish city of Reval in 1710. Catapults were used to deliver the cadaver of people that died of plague into enemies' camps heralding the commencement of advanced delivery of biological weapons, this led to plague epidemics also known as 'Black death' sweeping through Europe, Near East and North Africa and was probably the most devastating public health disaster recorded in history (Henschel, 1842; Norris, 1977; Da Silva, 1999).

Sir Jeffery Amherst in order to outplay the French during the French and Indian wars sent his soldiers with blankets and handkerchiefs from small pox stricken dead soldiers to sell to the native Americans who are ally to the French troops. The same technique was employed by Francisco Pizarro in his campaign against the natives in today's Peru in the 16th century (ADHS, 2005; Lim *et al.*, 2005; Philips, 2005; Kostadinov and Galabova, 2010).

The Japanese Aum Shnrikyo sect released the nerve agent 'sarin' in a Tokyo subway in 1995 following failure to obtain Ebola disease virus from Zaire in 1992, inability to release anthrax spore from a building and botulism toxin from a vehicle (Da Silva, 1999). They attempted to release aerosolized liquid suspension of *Bacillus anthracis* to cause inhalational anthrax epidemics which they believed would trigger World War and lead to

Asahora's ruling the world (Mangold and Goldberg, 2000).

In 2001, after the September 11 attack, 16 cases of anthrax were reported in the United States including a 63 year old man in Florida that was exposed to the biological agents while on outdoor activity, five deaths were eventually recorded. The United States senate majority leader also received a letter containing anthrax spores (Koblentz, 2003; Dembek *et al.*, 2007). In March, 2002, another case of cutaneous anthrax was reported and linked to the mails in a Texas laboratory (Alakpa, 2015).

In 1984, members of the Rajnaashee cult in Oregon deliberately contaminated salad bars with *Salmonella typhimurium*, an intestinal pathogen, aimed at securing an electoral result by incapacitating voters lacking empathy for the cult's preferential candidate (Torok and Tauke, 1997).

A total of 9 'ricin' bio threats were reported in 2003 in the United States of America, including the ricin discovered in a South Carolina postal facility in October 2003. Ricin was also discovered in February 3, 2004 in the senate office building in Washington. In April, 2013, letters positive for ricin was reportedly sent to Senator Roger Wicker, Mr. Bloomberg the New York City Mayor and President Obama (Dembek *et al.*, 2007; Bresnahan and Gibson, 2013; Maglio, 2013). There was West Nile outbreak in the United States in 1999 (Koblentz, 2003; Garfield, 2005).

Polio virus was reestablished and imported to at least 14 countries that were previously declared polio free due to the refusal of some local clerics and some Nigerian citizens to allow vaccination due

to allegations of contaminated vaccines that could lead to sterility or cause HIV/AIDS. Before that year 2003, Polio had been confined to only Nigeria, India, Pakistan and Afghanistan accounting for 93% of the world's cases (Hashmi and Lee, 2004). Transport of this contagious virus was not only limited to those countries but moved through Sudan, Ethiopia, Red sea, Lebanon, Yemen and Indonesia (Pallansch and Sandhu, 2006). Genetic fingerprinting confirmed that the strain imported to Indonesia came from Northern Nigeria (Arie, 2004). The rate and effectiveness of spread of the polio virus makes it a potential candidate for use as bio weapon in bioterrorism by terrorists.

It is reported that bio weapons are being used in the war in Syria which has led to disease conditions and death of many people. Terrorist attacks using bio weapons will always have great consequences on the health of the public nationally and globally.

Bioterrorism and National Security

National security is the safekeeping of the nation as a whole. Its highest order of business is the protection of the nation and its people from attack and other external dangers by maintaining armed forces and guarding state secrets (Holmes, 2015). It is a state or condition where the nation's most cherished values and beliefs, democratic way of life, institutions of governance and unity, welfare and well-being as a nation and people are permanently protected and continuously enhanced (Anon, 2015).

A bio warfare attack will not only cause sickness and death in a large

number of victims but will also aim to create fear, pains and paralyzing uncertainty with the goal of disruption of social and economic activity, environmental pollution, animal infection, plant destruction, starvation, breakdown of government entity and the impairment of military responses (Riedel, 2004). Diseases and deaths that will affect a group of people, including their animals, crops, land, water, government etc will definitely affect their economy and ultimately national security. It has been reported that the al Qaeda leadership has clearly indicated and demonstrated its intention to kill large number of people using biological weapons (Galamas, 2011).

Residents of North Eastern Nigeria were recently advised by security agents to avoid consuming water available in the area because Boko Haram was reported to have resorted to polluting wells and rivers with poisons and bio agents. Consumption of such water will result in sickness and death of residents and security personnel, which could have grave security implications.

The various attacks and reported intentions revealed the vulnerability of nations of the world to terrorism with increasing fear of bioterrorism attacks which will affect the security nationally and globally.

Conclusion and Recommendations

Anything that will jeopardize, paralyze and cripple the health of the people of a nation affects every aspect of their lives including national security. Users of biological weapons are endeared to the agents because they are unique in their invisibility and their delayed effects

(Riedel, 2004). In the proceedings of a meeting on Biological Warfare and Bioterrorism, Riedel Stefan averred that biological warfare agents may be more potent than conventional chemical and nuclear weapons. During the past century, the progress made in microbiology, biotechnology and genetic engineering has simplified the development and production of such biological weapons affirming the fact that infectious agents and diseases are potent weapons of bioterrorism (Riedel, 2004). Bioweapons have the capability to cause sicknesses, deaths, crop failure, famine, starvation, economic downturn, fear, panic, chaos, anarchy, uncertainty, disruptions of socioeconomic activities, breakdown of government authority and inability of military and national response. These have grave implications for national, regional and global security (Da Silva, 1999).

First to prevent the impending devastation of the use of bioweapons by terrorists, all countries should adhere to the Biological and Toxin Weapons Convention with effective, sustained monitoring and verification protocols put in place to ensure countries don't stockpile these weapons (Da Silva, 1999; CDC, 2015).

Second, dialogue should be employed as much as possible to settle conflicts and appease hurting and aggrieved groups to prevent degeneration of issues to war or biowarfare.

Third, nations should ensure early detection systems are put in place which include counterterrorism intelligence, control of imported and exported goods, as well as technological advances in the detection of bioterrorism agents. This should be of primary focus.

Fourth, enactment of national laws and strong legislation that criminalize the production, stockpiling, transfer and use of bioweapons should be done with effective enforcements. Capacity development, well equipped and highly motivated quarantine agencies are essential in the fight against bioterrorism. Fifth, integrated biosecurity approach to international relations in trade, transportation, travel and tourism should be employed as a precautionary measure. This should cover the environment and healthcare management, agricultural and food safety, ecology and biodiversity heritage management. This approach should be holistic as neglect of one area will lead to the collapse of the biosecurity system (Chukwu, 2004).

Sixth, public health practitioners and the public should be educated on the effect of bioterrorism on health and national security and the level of preparedness increased. The focus of public health should be prevention, early detection, good management and containment of new / emerging health emergencies.

Seventh, multiple communication systems are required and should involve all conflict management practitioners. Modern communication skills should be employed for effective information dissemination.

Lastly, biosurveillance should be embarked upon regularly to detect and investigating the presence of bioweapons.

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