



## **BIOLOGICAL WEAPONS A GLOBAL THREAT: A SUSTAINABLE APPROACH FOR EARLY IDENTIFICATION**

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**ABSTRACT:** *This study looks at the current threat posed by the biological agents and their sustainable early identification and awareness strategies. These biological agents are inexpensive to make, relatively easy to transport and can resist detection by standard security systems. There are 70 different types of microorganisms that can be used as biological weapons, but only 20-30% of the diseases they cause can be treated, which is the current global trend/ manipulation of warfare by terrorist. The Centre for Disease Control and Prevention (CDC) categorized these agents as A, B, or C, depending on the risk these agents pose to the national security, some of the diseases caused by these agents include; Anthrax, Smallpox, Plaque, Tularemia, Viral haemorrhagic fever. Despite the treaty acceded to, by 165 countries as of 2011, most states alleged to have or being interested in these weapons for war today. Although biological weapons have been a feature of international relations since the early twentieth century, the past decades have seen fears about them increasing with each passing year. As result of this, there should be a deliberate action by the world powers to put in place sustainable approach of checks and rapid respond to such eventuality by employing the services of forensics and other experts in the field.*

**KEYWORDS:** Sustainable Approach, Weapons, War, Bio-Violence, Biological Agents

### **INTRODUCTION**

The threat of biological agents as weapons has captured the attention of government and military officials, scientists, and the general public compared to other sector of the population. These biological agents are instruments of bio-violence that inflict harm through the international manipulation of microorganisms, or their natural products for hostile purposes (Kellman, 2006).

The pathogenic microbes have played significant roles in humanity's history (Diamond 1977; O'Neill 1977), due to its human, plants and animals' devastation. It was on this fact that the quick offensive biological warfare, including mass production stockpiling and use of biological weapons, was outlawed by the 1972 Biological Weapons Convention (BWC). The rationale behind this treaty, which has been ratified or acceded to 165 countries as of 2011, is to prevent a biological weapons attack which could conceivably result in large numbers of civilian fatalities and cause severe disruption to economic and societal infrastructure. Despite this treaty, most states alleged to have or being interested in biological weapons today that face adversaries that biological weapons might deter. This explained Saddam Hussein's long-standing interest in biological weapons (Pearson 2006).



The biological agents are inexpensive to make, relatively easy to transport and can resist detection by standard security systems (Bioterrorism overview; CDC, 2008). Presently, some of those countries that are facing one form of crisis and the other are planning and resolving to the use of these agents as against the conventional weapons for mass destruction. Based on the threat these agents cause to the human race, in 2011, letters laced with anthrax became weapons of death, illness, and terror in the United States. It is on this note too that, those countries facing military threats to their security and survival, since their weapons are inferior when compare are now turning towards the use of these biological weapons (Block, 2001). As threat of using biological agents in warfare is increasing, it becomes imperative to explore methods for their early and sustainable identification.

### **Aims**

To evaluate the implications of the use of biological agents in warfare and to explore methods of their early and sustainable identification.

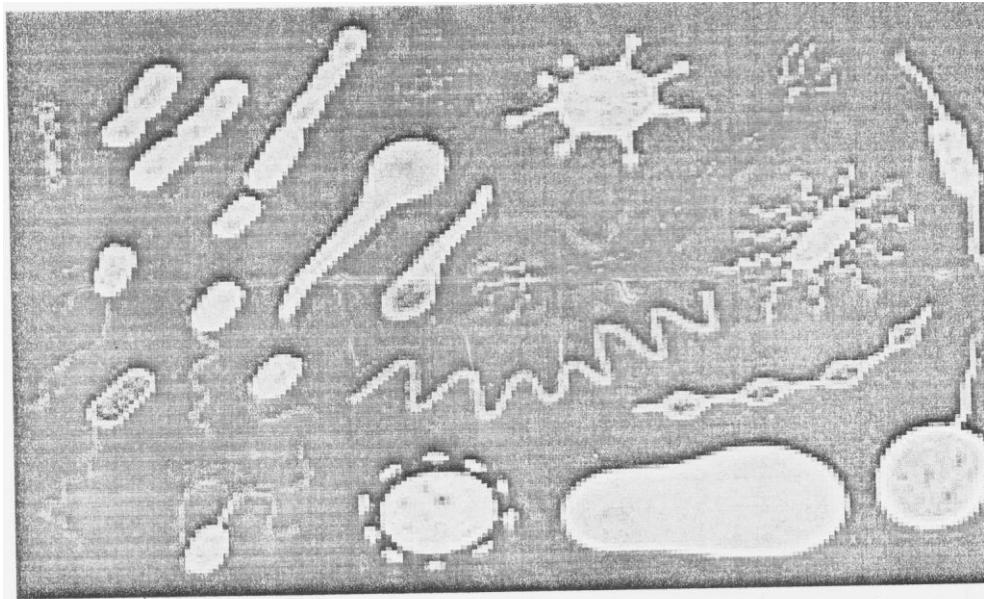
### **DISCUSSION**

The use of microorganisms and their components as weapons has been a reality for decades, though it is not too popular in the developing world unlike the developed world.

The early well-known attempt to use biological agents was during the 14<sup>th</sup> century medieval siege of Kaffa (Feddosiya, Ukraine). The attacking Tartars (Mongols) catapulted dead and dying plague victims into the city in the attempt to spread the disease. There has been speculation that escaping Kaffa victims may have carried the plague (also known as Black Death, Bubonic plague, or Black plague) to other parts of Europe, thereby hastening the ensuing pandemic. An attempt was made in 1763 by the British at Fort Pitt in Ohio River Valley to use blankets to transfer smallpox to Native Americans. The Fort had been afflicted with smallpox among the troops, and used linens from the infirmary were systematically dispensed to the neighbouring Indian populations. The last recorded case of smallpox was in Somalia in 1977. Today, only two laboratories are authorised to store the virus one in the United States

and the other in Russia. As recently as 1992, Russia had the ability to launch missiles containing weapons-grade smallpox. Not long ago, a letter laced with *Ricin* was sent to the President of the United States of America. A number of terrorist organizations, including Al-Qaeda, have explored the use of biological weapons (Centres for Diseases Control and Prevention, 2009).

There are 70 different types of bacteria, viruses, rickettsiae and fungi that can be used as weapons, but only 20-30% of the diseases they cause can be treated, which makes this threat so devastating. Because of the devastating nature of these biological agents, a treaty has been acceded to 165 countries as of 2011, to prevent these weapons from being use. Despite this treaty, most states alleged to have or being interested in these weapons for war today.



**Figure 1: Invisible-Dangerous Viruses & Bacteria Close Up (Source: Google images).**

*The Centres for Disease and Control (CDC) therefore categorised these agents as A, B or C, depending on their level of severity, some of these bio-agents include; Tularemia, Anthrax, SARS, HIV/AIDS, Q-fever, Clostridium and Salmonella species.*

### **Implications**

Findings from the published literature on the use of biological weapons shown in contrast, the illness and death from BW occur more slowly, with evidence of exposure and illness appears over time. Thus, a bioterrorist attack may at first be indistinguishable from a natural outbreak of an infectious disease. By the time the deliberate nature of the attack is realized, the health care system may be unable to cope with the large number of victims. For example disaster scenarios created by United States government agencies predict that the release of a few hundred pounds of the spores of *Bacillus anthracis* (the bacterium that cause the disease called anthrax), upwind of Washington D.C, could sicken or kill hundreds of thousands to millions of people within 24hrs. Forensic Scientists would likely respond by identifying the bacterium, tracing its source, gathering and analyzing other evidence from the bio-crime scene and the victims (source; Bioterrorism overview; CDC, 2008).

### **Sustainable Approach by Forensics on the Biological Weapons**

Apart from getting populace in the developing world educated and sensitized of these biological agents on their existence and devastating nature, which should be done through all possible means of communication. That is, both prints and electronic media should be employed, using different languages and interpretation strategies for better awareness and education on eventuality of these weapons. Other sustainable identification of these agents by forensics, is the application of the genetic technique, such as Polymerase Chain Reaction (PCR). The traditional forensic investigations relied on the use of techniques that required the growth of the target microorganisms. This approach has several limitations such as selection

of appropriate growth condition and unavailability of suitable laboratory facilities for culturing highly infectious organisms.

In view of this, the use of genetic technologies of identification represents a promising sustainable approach to these biological weapons. Of particular note, it is the use of polymerase chain reaction (PCR), which uses selected enzymes to make copies of genetic material. Within a working day, a target sequence of genetic material can be amplified to numbers that are detectable by laboratory tests such as gel electrophoresis. PCR can be used to detect a specific microorganism from among the other organisms present in a sample. The work of detection was made easy by the production of the PCR machine as indicated in the figure 2 below.



**Figure 2: Portable High-Speed PCR System (Ahram Biosystem,2012)  
www.ahrambio.com retrieved 2013-04-10**

Therefore, the work of detection is made so simple by the reduction of the PCR to a Hand-held detector (Ahram Biosystem, 2012), which can be used whenever and where ever for the detection of these biological agents. A recent example was the effort by United Nations and United States investigators to detect evidence of these biological agents in the aftermath of the two Gulf wars, using the Hand-held PCR machines.

## **SUMMARY AND CONCLUSION**

The use of biological weapons has raised and owes much to growing security and public health concerns, about the threat development these agents of mass destruction has globally. Although biological weapons have been a feature of international relations since the early twentieth century, the past decades have seen fears about them increase with each passing year. Many nations are still agitating of possessing them, despite the treaty. As a result of this, there should be a deliberate action by the world powers to put in place a sustainable approach of checks and rapid respond to such eventuality by employing the services of forensics and other experts in the field. This would go a long way to creates and maintains the condition under which humans and nature can exist in productive harmony that is fulfilling.



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