

Bioterrorism-A Threat to National Security

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Bioterrorism

The main aim of BWC implementation is to control bioterrorism nationally and internationally. I will be talking about bioterrorism and BWC, mentioning a little bit of its history and challenges due to emerging and re-emerging infectious diseases and their contribution to bioterrorism. The topic I am talking about today, is under discussion since 1990 but in 2001 the term of Emerging Infectious Diseases was coined for it, to emphasize the alarming situation of bioterrorism faced even after the implementation of BTWC. Let's see what we mean from the term "Emerging Infectious Diseases" and how they contribute to and create bioterrorism, and ultimately result in a threat to our national security as well as to international security. At the end I will discuss how we can control it nationally by following confidence building measures and then give some recommendations.

Bioterrorism is the intentional release or threat of release of biological agents, viruses, bacteria, fungi or toxins in order to cause harm to human population, livestock and agriculture. Now a day sometime it is very difficult to differentiate between intentional and unintentional release, so actually you have to prepare yourself against both.

The history of bioterrorism is very old, it started in the sixth century B.C. Some examples have also been mentioned by other speakers which took place whether intentionally or unintentionally, but they had harmed life on this planet.

The awareness developed with passing time and in 1972 the Biological Weapons Convention came into being. The Convention prohibits the stockpiling and offensive use of biological agents, but even after ratifying it Russia continued to carry out its bioresearch program with more than 60,000 research workers¹.

BTWC, was signed in 1972 and entered into force on March 26, 1975. It is the first multilateral disarmament treaty of Biological and Toxic Weapons. Now after 43 years BTWC has 181 countries as its members. The most important and alarming drawback of this treaty, as compared to CWC, is the absence of a dedicated international verification organization and the Convention by itself has no provision to verify compliance, which hampers the technical implementation of BWC.

You have to see this keeping in view of the fact that the biological agents are more dangerous than chemical and nuclear weapons and there being no procedure to verify that how many states have biological weapons or have the capability to develop biological weapons adds this danger. In 1975 it was thought that only 1 or 2 member states other than super powers had biological weapons but now it is believed that 12-15 countries have such weapons. The international community is working hard for the sake of mankind to stop biological agents being used as weapons.

BTWC had been ratified by 179 countries in 1972, but even after that there are incidences when the bioterrorist threat came to light in 1979, 1984, 1991, 1995 and 2001. This has pressed the bio-scientist and decision makers to think about measures to confront the bioterrorism threats to national & international security. Due to existence of many different types of bacteria and viruses, toxins, and disease caused by them have created real challenges.

It is important that about 14 countries haven't signed the Convention – but even the 181 countries which are party to it do not have any legislation for implementation – beside that we know there is no verification procedures – this puts all the states at the risk of being targets of bioterrorism. There is no universal method for control of disease outbreak and to cover the Science & Technology advances. Only stringent national implementation procedures and CBMs can help to control threat from biological material.

Easy production of many bacteria has made bioterrorism threat easy – to control this and to allocate lot of money in bioresearch the United States coined the term Emerging Infectious Diseases in 2001. This has two other categories, the New Emerging Infectious Diseases and Re-emerging Infectious Diseases. Emerging infectious Diseases mean the disease of future on which some Research & Development (R&D) has been done, whereas new emerging diseases are those on which no Research & Development has been done, so actually under these two categories we started thinking of future suspected diseases and their control. The third term is Re-emerging infectious diseases. These are more dangerous especially for developing countries because these diseases re-appear with more drug resistant bacteria which become even more difficult to control.

There are some eight emerging diseases mentioned by WHO, but very few cases are reported. In some cases, origin is known and some are not known (basically these were detected in Africa, 2 in Asia, 1 in China and 1 in SA).

All infectious diseases are caused by bacteria or virus. These are divided into three categories on the basis of their potential for bioterrorism. The important factor I like to mention here is that developed countries have their vaccine banks in which they keep vaccines for their whole population in case of emergency. Whereas, in developing countries we can only imagine this, and are very far from having these facilities. In fact, we haven't even started any work in this direction.

With reference to the new emerging infection diseases and re-emerging disease, I like to discuss the important contributory factor of climate change which plays an important role in re-emergence of infectious diseases. Weather changes such as precipitation, temperature, drought and floods have direct or indirect effects on outbreaks of infectious diseases transmitted by rodent's, mosquitos and water. Research groups are needed to develop Predictive

Framework to integrate knowledge from ecophysiology and modelling for effective control.

The most important potential of bacteria and viruses is to remain dormant until suitable conditions available, due to which Bioterrorism is more dangerous than chemical and nuclear terrorism. It is the incubation delay or period which takes 7-20 days of symptoms of a disease to appear – no nation can protect its population by simply screening the travelers. In order to control bioterrorism, as a first priority we have to develop stringent surveillance methods, rapid and sensitive screening procedure of detection and efficient and fast methods of reporting.

Here I would like to mention Disease Early Warning System (DEWS). In which three organizations collectively, can play an important role (Rural and District Health Centers of Ministry of Health, PMRC laboratories and NIH). The first two have a crucial role in surveillance and collecting the samples and the third for R&D findings to control the disease.

Though BTWC consists of many articles but here we are concentrating on Article IV and X and how these articles can be implemented.

To fully implement BWC States Parties are obliged to translate the commitments of Convention into effective national actions. These necessary measures depend on the circumstances and legal system of each State Party and as such there can be different approaches to implementing the provision of the Convention nationally.

Actually the most important thing is the implementation and the Seventh Review conference, in 2011, has emphasized on this.

In my view there are two important things, first of these is development of awareness and Code of Conduct and Code of Ethics in academic and research organizations along with industry and second is strengthening of capacity building for surveillance and detection of Emerging and Reemerging Infectious Diseases outbursts at national level.

If we don't do it nationally, the Eight Review Conference in 2016 (after 10 years of discussion) has given a role to the international organization of interfering in any country. But given a leverage to developing countries by adding a clause "when required and upon request of State Parties.

Nationally we can provide protection by taking important steps of vaccination and surveillance and connectivity and Confidence Building Measures such as National Procedures on Risk Assessment of Pathogens, their processing and handling and transportation. Licensing and registration of facilities, awareness and education program for life scientists, and establishing a national body to implement these programs. Achieving this objective has become more problematic in this context after the adaptation of 18th Amendment to the constitution of Pakistan.

Pakistan has made many efforts to control bioterrorism and spread of diseases by putting in place different laws. These include Drug Act 1976, Animal Quarantine act 1979, Antiterrorism Act 1997, Export Control Laws 2004, Biosafety Guidelines 2005 and Internal Compliance Committee 2016 for HEC formed by SECDIV. But there are many other actions which are needed for national security in this regard.

A National Action Plan could be developed for this purpose. But I like to mention here and put forward three immediate

recommendations directly relevant to the topic of Emerging and Reemerging Infectious Diseases and control of bioterrorism.

The first is increase of teaching and training by becoming member of two international organizations, the Australia Group and Wassenaar Arrangement. Second is to introduce Disease Early Warning System to increase surveillance, detection and reporting and the third is to upgrade vaccine production facilities and to develop a vaccine bank. At the end I will like to put forward all the essential recommendations.

- An Umbrella National Scientific Organization dealing with all BWC/CWC matters may be established.
- This organization can put in place a more comprehensive mechanism for implementation of BWC/CWC. One step towards that end would be to establish a working group comprising of scientists, bureaucrats and policy makers to actively pursue issues of national implementation, assistance, cooperation with national and international stakeholders.
- Steps may be initiated for early approval of the BWC Act for effective implementation of the Convention.
- Consultations with like-minded states should be initiated to develop a draft protocol to be signed by states for cooperation to promote beneficial scientific development that contribute to control the spread of biological weapons.
- Technology and pool of human resources available for dual use technologies, should be developed for:
- Capacity building and enhancing effective implementation of peaceful applications.
- Adaptation of Internal Compliance Program (ICP) should be achieved by formation of biosafety and biosecurity procedures and Codes of Conduct and Codes of Bioethics at universities and other institutions.
- An effective disease surveillance system, efficient & sensitive deduction system with reliable connectivity with national and international health systems should be developed
- At national level Disease Early Warning System (DEWS) should be made more effective (for this a network of RHC, PMRC & NIH may be built)
- There is a need to invest in Production of Vaccines (Typhoid, Cholera, Tetanus Diphtheria, Measles, and Rabies) in the country. A Vaccine Bank should be developed – eventually having Vaccine for everyone.
- Pakistan should adopt international guidelines for World Organization for Animal Health for control of animal diseases.
- A National Chem-Bio Protection Policy for seamless coordination of resources at national level may be adopted.
- There is need for training, cooperation and partnerships in implementation of research agenda - Pakistan should become a member of Australia Group (control biological agents/synthetic biological agents) and Wassenaar Arrangement (dual use goods & Technologies). Their technical support and help will be useful for our human resource development
- An updated list of microorganism should be prepared (Australian Group & Wassenaar Arrangement criteria should be maintained).
- Cargo monitoring of transit trade through Pakistan using modern equipment should be made essential as a part of checking on the borders.
- Certified specialists to monitor the trade and industrial activities in this regard should be prepared.
- Scientist (biochemist, microbiologists, biotechnologist and genetic engineers) should be made familiar with State-of-Art investigation procedures, and innovative technologies of control and efficient

detection of microorganisms to implement biosafety and biosecurity procedures.

- Anti-Terrorism Act 1997 Section (b) may be amended by adding a new sub-section 2 “involves manufacturing, acquiring, possessing, developing, transporting or transferring biological weapons and their means of delivery.”

References

1. Convention on Prohibition of the Development, Production, stockpiling of BTWC (2018).
2. Convention on Prohibition of the Development & stockpiling of BTWC on their Destruction (1972) Audio Visual Lib Int Law.