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Skripals', Novichoks and Russia: Toxic Mystery Deepens amid Denial

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Summary

The nerve agent Novichoks poisoning episode in United Kingdom once again put a question mark against the efficacy of the international arms control regime such as Chemical Weapons Convention. The Novichoks events involving a former Russian spy and his daughter as victims, triggered a diplomatic crisis and a pitched geopolitical manoeuvring as fingers pointed at Russian agency as the chemical agent in question was originally developed to circumvent the international arms control regime by the country in the 1980s and stockpiled for possible tactical use, such as State sponsored assassinations. This event and few others in the recent past, e.g CW use in Syrian war, involving both State and Non state actors have certainly raised the spectre of a chemical holocaust. This article attempts to trace history of Novichoks in Russia's secret arsenals and the recent fall out in the light of Skripals' poisoning episodes in Salisbury, UK.

The incident of poisoning of Sergei Skripal, a former Russian military intelligence official, and his daughter on March 4, 2018 in Salisbury, (United Kingdom) allegedly by the Russians has caught the attention of the world. Two months after the notorious incident, on May 18 Russian President Vladimir Putin said that 'Sergei Skripal would be dead if military grade toxin was used'. With this remark, Putin pushed the investigations of the alleged use of nerve agent 'Novichoks' against Sergei Viktorovich Skripal and his daughter Yulia Skripal into complete disarray. Now both Putin and Moscow have denied any involvement whatsoever in Skripals' poisoning. More so, Moscow has denied conducting any past research on nerve agent or developing the so-called Novichoks in Russian military arsenals. One of the officers identified as detective Nick Bailey who had inspected their house and the crime scenes in Salisbury, was admitted with similar symptoms after exposure to the agent used against Skripals'. The daughter Yulia Skripal was discharged from Hospital in April and her father was discharged in mid May 2018.¹

In the 1990s, Skripal was an officer of the Russia's Main Intelligence Directorate (GRU) and worked as a double agent for the British intelligence agency MI until his arrest in December 2004 in Moscow. In 2006, he was convicted of treason and sentenced to 13 years in a penal colony by a Russian court. He settled in the UK in 2010 following a spy swap program. His daughter Yulia is a Russian citizen and was visiting her father from Moscow at the time of the incident.

After initial investigations and laboratory examinations, the chemical used in Skripals' poisoning has been traced to Russian chemical weapons research and the used chemical substance was identified as a military grade nerve agent code named

Novichoks, by experts at the Defence Science and Technology Laboratory (DSTL), Porton Down, UK. However, the experts at DSTL are unable to pinpoint the source of the Novichoks though needle of suspicions is squarely on Russia because the chemical agent in question was part of group of chemical agents originally developed by Russia in the 1980s and stockpiled in the past for possible tactical use, such as State sponsored assassinations.

After the flurry of accusations pointed towards Russian involvement in Skripals' murder attempt and the blame for developing and keeping secretly banned chemical weapons, Russia clarified that all Soviet era activities on chemical weapons were discontinued and dismantled in early 1990s and every stockpiles were destroyed in 2017. The Russian foreign ministry too has claimed that neither Russia nor the former USSR ever conducted research to develop chemical weapons under the name or codename Novichok.

On earlier occasions, Putin's spokesman Dmitry Peskov termed all these brouhaha over the Skripals' poisoning as 'mad accusations' without any substance against Russia. Despite Russia's repeated denial, accusations and public spat between Russia and UK increased manifold when other countries like France, Germany and the US backed the UK's assessment about possible Russian involvement. It triggered in fact a diplomatic crisis when over 20 countries showed their support for UK against Russia's suspicious action. The UK and other western countries have expelled several Russian diplomats (suspected to be spy or engaged in espionage) over the Novichok incident and that led to the expulsion of British diplomats from Russian soil.

The name Novichoks itself signifies newcomer or newbie in Russian. These are known as third or fourth generation chemical

weapons, which were reportedly developed under a (erstwhile) Soviet programme codenamed 'Foliant'. Though much of the development process and stockpiling is shrouded in mystery, its existence was revealed in the Russian media by the Russian scientists Vil S. Mirzayanov and Lev Fedorov in the early 1990s. Both had written an article for Moscow News titled "A Poisoned Policy."² The article laid bare the secret chemical research and development in Soviet and how the government backed programme was poisoning its own citizens. The authors raised questions over environmental safety standards at Russia's chemical weapon production and testing sites as well. Mirzayanov who worked at the Research Institute of Organic Chemistry and Technology, a secret Russian facility in Moscow, was subsequently jailed for divulging state secrets and later moved to the US.

Mirzayanov was part of the team which developed the Novichok group of chemical weapons. According to him, the Novichok class of weapon is more than 10 times as powerful as the nerve agent VX. He pointed out two Soviet era facilities where Novichok research and testing were undertaken: the Chemical Research Institute, located in Nukus, Uzbekistan and Krasnoarmeysk testing site near Moscow. According to him, the Novichoks testing had demonstrated effectiveness as a military weapon in both unitary and binary forms.

Mirzayanov, who authored a book titled 'State Secrets' (2009) dealing with the secret chemical weapon research and development of Russia, blamed the Russian State authorities for the foiled assassination attempt on Skripals and believed that the agent used is too complicated for Non-State Actors (NSAs) to possess. But he may not be entirely right as past events have suggested that these weaponised CW agents can reach NSAs through various covert ways. In March 2018, the Russian

newspaper *Novaya Gazeta*, often critical of the Government, published a report on Novichok group of chemical weapons research and development that stated how it reached Russian gangsters through black market in the early 1990s.³ It cited documents relating to criminal case No. 238709 on the poisoning and death of Rosbiznes bank chief Ivan Kivelidi and his secretary Zara Ismailova. The report also detailed how the Novichok exposure created health problems for Kivelidi's staffs and police officials.⁴

The chemical weapons watchdog Organisation for the Prohibition of Chemical Weapons's (OPCW) Technical Assistance team that visited the poisoning sites in Salisbury confirmed the use of Novichok and concluded that the chemical substance found was of 'high purity, persistent and resistant to weather conditions'. However, the OPCW team could not determine the amount of the nerve agent that was used against the father-daughter duo in March 2018.

Russia, which is quite famous for state secrecy and equally notorious for prosecutions of whistle blowers, remains in denial concerning Skripals' assassination attempt in the UK. Without giving any substantial evidence of its innocence, Russia resorted to various conspiracy theories and blame game on this case. And importantly, it vehemently disowns any development of CW during the Soviet era. The timing of Novichok development and secret stockpiling in the early 1990s in Russia coincided with international arms control verification efforts, especially in the sphere of chemical weapons. International experts are now questioning Russia's intention behind developing Novichoks in the first place that included evading international verification regime such as the Chemical Weapon's Convention (CWC) and the implementing agency OPCW's vigil.

The Skripals's poisoning, the assassination of North Korean leader Kim Jong Un's half-

brother Kim Jong-nam in Malaysia with the nerve agent VX in February 2017 and widespread use of chemical weapons in Syrian civil wars for past several years, put a question mark against the efficacy of one of the successful arms control regime i.e. CWC. The fourth CWC review conference is around the corner and schedule to be held in November 2018 in the Hague. With its almost universal memberships the Treaty regime has now few options to remain credible. The most important should be getting conclusive findings on the allegations. Again, the OPCW has to find out the treaty violators whether it is Syria, North Korea or Russia and to make them accountable. Failing to rein in the perpetrators either by consultations or confrontations, CWC and OPCW would be ineffective in the face of an increasing hostile geopolitical environment raising the spectre of chemical weapons use by both State and Non State actors.

Endnotes:

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Islamic State's tryst with chemical weapons in Syria and Iraq

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Summary

The Islamic State in Syria and Iraq (ISIS) Jihadist group's indiscriminate use of chemical weapons or agents against civilian and military targets in the last few years violates every international and humanitarian laws. It has not only used the weapons in its violent campaigns, but has attempted to build full-fledged chemical arsenal within its controlled territories which makes it virtually the first non-state actor pursue chemical weapon for military purposes. This piece examines ISIS' nascent chemical weapons of mass destruction program and how it has effectively used against targets in Syria and Iraq.

The sporadic and indiscriminate use of chemical weapons in Syria and Iraq's conflict zones in the last five years by both State and non-state actors have posed a great challenge to the international arms control and non-proliferation regimes. The use of these deadly weapons of mass destruction targeting civilians not only violates international law, but is also a crime against humanity. However, the perpetrators of the chemical weapons attacks including the Bashar al-Assad regime are still on the loose and have successfully evaded international scrutiny. The worst part of this otherwise multi-dimensional conflict is the use of chemical weapons or agents by non-state jihadi group -- the Islamic State in Iraq and Syria (ISIS) or Daesh. It has not only used the weapons in its violent campaigns, but has attempted to build full-fledged chemical arsenal within its controlled territories.

Historically, no organized and designated terrorist groups have perpetrated mass fatality or disruptive attacks using any categories of weapons of mass destruction. Since the capability and intentions of jihadist groups such as Al Qaeda and ISIS have changed over the years, they opt for the most destructive and spectacular methods with available weapons system, materials or technology to maximize the impact and fear factor. The ISIS, the violent Sunni Jihadist movement that has dominated large swathes of territory had achieved some tangible success in employing these destructive and disruptive weapon systems or materials in Syria and Iraq.

Ideologically, Islamic State in Syria and Iraq has strong roots in the ideals of Abu Mushab al Zarqawi of Jordan, who was identified as Al Qaeda's chief biochemical engineer before his death in 2006. It was widely believed that

Zarqawi imparted training to a special terror cell in Afghanistan and Iraq on the use of biological and chemical agents for possible attacks in Europe and the Middle East. Zarqawi's lingering influence as a founding father of ISIS leads us to believe that this violent group won't hesitate to use these categories of weapons mass destruction and disruption against its civilian or military targets.

It is also believed that the IS leadership has received religious approval from various Islamist clerics for the use of such weapon systems. One such jihadi cleric named Nasir al-Fahd, who is currently imprisoned in Saudi Arabia, issued a religious edict or fatwa sometime in 2003 saying, "If the Muslims can't overwhelm the infidels in any other way, they are allowed to use weapons of mass destruction to kill everyone and erase them and their descendants from the earth." Al-Fahd has authored a book that approves the use of weapons of mass destruction against the non-believers.¹ So use of chemical or biological weapons by Jihadist groups against adversaries is not any more un-Islamic. In other words, the use of these weapons is no more prohibited in Islam as perceived earlier.

ISIS faced massive territorial and military reversal in Syria and Iraq recently. However, in the initial years of territorial consolidation phase, the Islamic State captured secret labs and factories in Iraq and Syria that may have helped it to pursue chemical weapon production activities. In all probability, Islamic State exploited the existing stockpiles belonging to the Iraqi or Syrian regimes, which had extensive CW programs.² In June 2014, there were reports about the capture of Saddam Hussein era chemical facility at Muthanna, near the city of Samarra, by Islamic State militants. However, the claim from the IS side regarding the possession of chemical

weapons, such as mustard agents, came in late August 2015 from a Dutch soldier turned IS fighter identified as Omar Yilmaz, who indicated that the group has acquired chemical weapons once belonging to Syrian President Bashar al-Assad's government. Yilmaz's revelations came with a series of suspected incidents of mustard gas attacks in northern Iraq and Syria.

In February 2016, the capture of Suleiman Daoud al-Afari, a senior engineer of ISIS' chemical weapons program, from Badoosh in north-west of Mosul, then a IS stronghold, unearthed the evil designs of IS and how it planned to use chemical agents against its adversaries in Syria and Iraq.³ Some Iraq affair experts had informed then that al-Afari was the technical expert on the chemical weapons project, but the real ideological driver behind the program was Taha Rahim al-Dulaimi. It is important to note here that al-Afari had been a member of the military under Saddam Hussein and had joined the Islamic State later.

With significant territorial losses in Iraq and Syria in mid 2017 (between June -August), the IS may have abandoned its chemical weapons/agent production by now. However, before abandoning its embryonic chemical weapons program, IS has left a mark using this insidious weapon several times since 2014 mostly with industrial chemicals like chlorine and phosphine. Independent sources such as Conflict Armament Research (CAR) and the Syrian Observatory for Human Rights (SOHR) have claimed that the ISIS has used chemical weapons several times against Kurdish forces between January-June 2015. In August 2015, the German Defence Ministry too reported IS's chemical weapon use in Erbil in Iraqi Kurdistan.⁴ The same month, the United States officials stationed in Iraq claimed that IS used sulphur-mustard in a mortar attack on Kurdish forces in

Makhmour town located in northern Iraq.⁵ Also, few reports of mustard agent use in al-Hasakah and Marea towns in Syria surfaced that month and the IS was suspected behind these strikes. In early 2016, the IS activities involving use of chemical weapons surfaced frequently as CW attacks spiked till January 2017 in Iraq and Syria.

In April 2016 the Islamic State group used mustard gas on Assad regime troops at an air base near the city of Deir el-Zour.⁶ Again between September and December 2016, chemical agents, mostly sulphur mustard, were used by the Islamic State group against targets in Aleppo and Hama Governorates. The last reported chemical attack by the Islamic State in Syria occurred in Talla al-Maqri, Aleppo in January this year (2017).⁷

In May 2016, Islamic State militants targeted Bashir in Kirkuk in northern Iraq releasing toxic mustard gas.⁸ Few months earlier, Islamic State fighters launched two chemical attacks in Kirkuk targeting the town of Taza.⁹ In 2017, there were few cases of suspected chemical weapons use by ISIS in Iraq's Mosul.¹⁰

The IHS Markit's Conflict Monitor suggests that there were over 70 alleged chemical weapons attacks perpetrated by the ISIS-41 in Iraq and 30 in Syria.¹¹ With a series of attacks to its credit, the Islamic State virtually became the first non-state actor to develop and deploy banned chemical warfare agents for military purposes. However, with the loss of its last few bastions in Iraq and Syria, the Islamic State, which is now virtually on the run and seeking safe haven for its leaders and loyal foot soldiers, may abandon this weapons program. But so far there is no publicly available evidence to suggest that the Islamic State has dumped or concealed its chemical arsenals or transferred any CW materials from its earlier strongholds.

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‘Nerve Agents’: Potent Chemical Weapon for War, Terrorism and Assassinations!

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Summary

In 2017, there have been two unrelated events where nerve agent have been used. This calls for close examination as the nerve agents are banned but can still be easily manufactured and are potent.

Since the beginning of this year, we have witnessed two distinct chemical weapon events involving the use of the lethal nerve agents. In February, a North Korean national, Kim Jong Nam, was killed when nerve agent VX was smeared on his face at Kuala Lumpur airport terminal, Malaysia. Just a few months after this, in early April, nerve agent was used in Khan Sheikhoun town in the northwestern Idlib governorate in Syria killing and maiming over a hundred people, including children. The Khan Sheikhoun incident reminded us of the August 2013 chemical weapon attack in Ghouta that killed over a hundred people near Damascus, Syria’s capital. These two incidents, though unrelated, necessitates close examination as the potent nerve agent, a banned but easily manufactured chemical weapon, was used in both the cases despite international proscription. Although it is common knowledge now that toxic chemical agents like chlorine, mustard or nerve agents are extremely potent, invisible and indiscriminate use against population targets and successfully used in the past to accomplish specific military goals, its atrocious use for terrorism and assassination purposes warrants action against the perpetrators.

Agents of Fear and Death:

Nerve agents are highly potent, colourless, odourless, tasteless chemicals which belong to organophosphorous insecticides category. Categorized as G series: Tabun (GA), Sarin (GB), Soman (GD); and V series (VX, VXII), these agents are known for their persistence and toxicity that make them suitable for weaponisation. The G series were discovered by the Germans as insecticides but sooner it was recognised as potential chemical warfare agents. Documented history of nerve agents

informs that the first nerve agent ever synthesised was Tabun in 1936, followed by Sarin in 1939 and Soman in 1944. The lesser known Cyclosarin (GF) was discovered in 1949. However, unlike G series of nerve agents, the lethal discovery of VX took place in the United Kingdom during the course of civil pesticide research before it went to the military laboratory for war related synthesis and development in both UK and US by November 1955.¹ Infamous for its high toxicity, the VX, for example, is about 2000 times as toxic as mustard gas by skin absorption and about 300 times as toxic through the lungs.² Studies anticipated that 5 milligram of VX, if used properly, can kill approximately 6 soldiers.³ If exposed to higher dosages, the symptoms will progress more rapidly through difficulty in breathing, nausea, vomiting, involuntary defecation and urination, convulsions and finally death.⁴ The V-agents, more toxic than the G-agents, act rapidly if inhaled and act much faster through the skin. The V-agents can be dispersed in aerosols as direct contact is hazardous, especially on exposed skin or as a persistent indirect hazard contaminating the soil vegetation and equipment. This is why VX, the most volatile Nerve agent, is stockpiled in the secret military arsenals for its military effectiveness. The liquid properties of most of these nerve agents make them suitable for weaponisation and can be delivered using mortar shells, missile warheads, landmines, grenades, etc., through both aerial or ground dispersal vehicles.

Throughout last century, development of nerve agents in secret arsenals by both States and non-State Actors and its lethal application in war and in peacetime, dominated non-proliferation discourse. The UK's Porton Down, USA's Edgewood and Rocky Mountain Arsenals, Iraq's Samarra chemical complex, among others, have carried out in-depth studies, development and weaponisation of nerve agents. The

Persian Gulf War in the 1980s, however, showed definite evidence of the use of nerve agents and other chemical weapons (e.g. mustard agents). The most notable was March 1988 Halbaja incident when the then Iraqi regime targeted this Kurdish town with mustard gas and a host of other nerve agents (cocktail of Tabun, Sarin and possibly VX) killing over 5000 people. As per one estimate, of those who were killed 75% were women and children. Those who survived this chemical weapon mayhem subsequently developed critical respiratory, visual and psychological problems for life.⁵

Unlike Halbaja incident, which was condemned as crime against humanity perpetrated by a State actor, Tokyo subway nerve gas incident in 1995 orchestrated by a Non State religious cult to spread death and fear can be categorised as an act of terrorism against civilians. However, before this actual event in Japan, couple of times in the past, nerve gas scare was spread by criminal minded individuals like Muharem Kurbegovic (better known as the Alphabet Bomber or Isaiak Rasim who headed a group called 'Aliens of America'), who attempted to spread panic and terror in the US in June and August 1974 threatening to use nerve agents.⁶ However, the hollow threats and scaremongering using nerve agents turned out to be a reality when members of Aum Shinrikyo, a Japanese millennial movement led by its blind but charismatic cult leader Shoko Asahara, spent millions on weapons of mass production plant for nerve agent Sarin and other weapons to spread terror in Japan and beyond. The Tokyo incident in which the deadly nerve agent Sarin was released in the Tokyo subway system killed 12 people and injured scores of commuters.⁷

North Korean Connection

After two decades of the 1995 Tokyo subway nerve gas incident, the horror associated with

the nerve agents returned once again in February 2017 with the death of Kim Jong Nam, the 45-year-old estranged half-brother of the North Korean Supreme leader and Chairman of the Workers' Party of Korea. Investigations into Kim Jong Nam's assassination have revealed few details so far, including that his death was due to exposure to the VX nerve agent and two women (one Vietnamese and an Indonesian) who smeared his face with the liquid have been charged with the murder. Samples taken from the skin and eyes were identified as VX (ethylS-2-Diisopropylaminoethyl methyl phosphonothiolate) in a preliminary analysis by the Centre for Chemical Weapons Analysis of the Chemistry Department of Malaysia.⁸

Although the North Korean regime has vehemently denied any involvement in the assassination, the needle of suspicion is still on North Korea. At present, Malaysian authorities are investigating the case, zeroing in on few North Korean nationals who are believed to be hiding in North Korea's embassy in Malaysia or who could have fled to Pyongyang.⁹ Apparently, Malaysian police is also investigating to fathom how this banned substance VX was brought into the country and where it originated from.

The Democratic People's Republic of Korea is known to have launched an acquisition and domestic production program of chemical agents, including mustard and other nerve agents, in the late 1970s. Reports emanating from neighboring South Korea have estimated that North Korea's stockpile of chemical weapons agents ranged between 2,500 and 5,000 tons.¹⁰ Worryingly, North Korea is not a member of the Chemical Weapon Convention (CWC) -- it has neither signed nor acceded to it.

The country has already received warning letters from the United Nations and the

OPCW for this assassination allegation using banned chemical weapon. These international bodies have also urged this reclusive Nation to join the CWC at the earliest and declare or renounce its clandestine weapons programs.

Syria again!

The August 2013 Ghouta chemical weapon incident and few subsequent small scale chemical weapon events during Syrian civil War are still fresh in the minds of this generation, while another equally devastating chemical weapon attack took place on April 4, 2017 at Khan Sheikhoun, a town in the northwestern Syrian Governorate of Idlib. The nerve agent used in the attack killed nearly 90 people, many of whom were children. The Khan Sheikhoun attack sparked international outrage as it proved the widespread use of Chemical weapons in the ongoing War. Unlike in earlier occasions where Chlorine gas and sulphur mustard were used, the latest strike was aimed at inflicting massive physical damage and moral trepidation within the civilian population. Hospitals treating the victims and subsequent laboratory analysis of samples by the French, British and Turkish governments have confirmed the use of Sarin nerve agent.¹¹

The OPCW has observed that there were at least 30 chemical weapon incidents reported in the second half of 2016, and 15 incidents in Syria since the beginning of 2017.¹² To note, Syria, which joined the CWC in 2013, is believed to have chemical warfare program and stockpiles of nerve agent Sarin for offensive purpose. The country also reportedly destroyed 67,098 metric tons of chemical agents since it joined the CWC. However, it is likely that the Basar al Assad regime might be withholding some chemical agents in the guise of agricultural or industrial research, jeopardising complete destruction

efforts by OPCW. While the allegations and ground evidences from Khan Sheikhoun are going against the Syrian government forces, there are few allegations against the warring rebel groups active in Syria as well. The Syrian government has denied its involvement in the toxic attack and in turn blamed rebel groups for the Khan Sheikhoun incident. This controversy will continue over the actual user of the chemical weapon in Syrian war theatre for times to come.

Conclusion

International efforts to proscribe the use and development of chemical weapons reached a landmark in 2017 during the marking of the 20th anniversary of the Chemical Weapons Convention (CWC) and the founding of the OPCW, the organization that helps in implementation of global ban on CW, defining its use as a taboo under international law. Not long ago, in 2013, OPCW, the international anti-chemical weapon regime, received Noble Peace Prize for its efforts to eliminate chemical weapons and in 2015 it commemorated the 100th anniversary of the first chemical agents use during the first World War in Ypres (Belgium) and in Bolimow (Poland). As per official assessment, approximately 95 per cent of declared chemical weapon stockpiles have been eliminated so far under the supervision of OPCW over the last two decades.

The confusion and blame game would persist as long as UN mandated chemical inspectors review and examine the biomedical samples from victims and environmental samples from the epicenters before a stipulated time. The deteriorating Syrian war situation makes things difficult to ascertain the real perpetrator of ongoing chemical anarchy. OPCW's request to send a technical mission to both Khan Shaykhun and Al-Shayrat airbase in Syria to establish the facts behind the latest Nerve agent attack is still pending.

In this situation, the upcoming Eighty-Fifth Session of the Executive Council at OPCW which will be held from in July 2017 would be vital especially with regard to the recent widespread chemical weapons use in Syrian civil war and elsewhere (e.g Kuala Lumpur). These incidents have virtually questioned the effectiveness of the international regimes and underscored the urgency for a robust collective effort to bring the possessors or users of this insidious weapon agent to justice and complete destruction of remaining stockpiles.

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PrepCom: Setting the Stage for the 'Eighth' Review Conference of the Biological Weapons Convention

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Summary

In April 2016 the Preparatory Committee meeting for the Eighth Review Conference was concluded. This will be followed by another meeting in August 2016. Two major points were discussed during the April meeting, the issue of science and technology and effective inter-sessional process.

On April 26, 2016, the Preparatory Committee (PrepCom) meeting for the Eighth Review Conference (RevCon) of the Biological Weapons Convention (or BWC) jump-started the Convention's quinquennial review process which is scheduled to be held in Geneva from November 7 to 25 this year. The two-day PrepCom meeting in April, while setting the necessary procedural arrangements for the successful conduct of Eighth RevCon, focused on the 'general exchange of views' on matters of BWC and the organizational aspects of the forthcoming RevCon such as the Presidency, the distribution of posts of Chairs and Vice-Chairs and the draft Rules of Procedure. The second session of PrepCom meeting will reconvene again from August 8 to 12 this year, when the States Parties will deliberate all provisions of the Convention.

The first session of PrepCom meeting witnessed participation of at least 86 States Parties, one State neither party nor signatory to the Convention, one regional intergovernmental organization and eight non-governmental organizations. In addition, Ambassador Gyorgy Molnar of Hungary was elected as Chairman of the Preparatory Committee as well as nominated to act as President of the forthcoming Eighth Review Conference. Ambassador Michael Biontino of Germany and Ambassador Boudjemâa Delmi of Algeria were elected as Vice-Chairmen. There was also understanding among the various Regional Groups on the posts of Vice-Presidents of the Conference as well as Chairmen and Vice-Chairmen of the subsidiary bodies (e.g. 'Committee of the Whole, "Drafting committee" and "Credential committee"). At least 20 Vice Presidents were nominated for the Conference dominated by the Group of the

Non-Aligned Movement and Other States with 10, followed by the Western Group with 6.

There were 29 Statements presented at the PrepCom that included regional groups (Non Aligned Movement) represented by Iran, and other specific statements by State parties such as India, Finland, United States, Russia, UK, France, China, Switzerland, Indonesia, Norway, Italy, Australia, Ireland, Japan, Germany, Canada, Morocco, Mexico, Cuba, Pakistan, Armenia, Belarus, The Netherlands, Peru, Republic of Korea and the European Union. Iran also issued its official statement at the PrepCom.

While many of these statements made references to previous Working Papers (WPs) submitted at the BWC meetings the April PrepCom meeting, saw submission of at least 12 Working Papers. The Russian Federation has submitted two WPs on the Operationalisation of Mobile Biomedical Units to deliver protection against biological weapons, investigate their alleged use, and to suppress epidemics of various etiologies and on the establishment of a Scientific Advisory Committee. The US, Switzerland, and United Kingdom (and Northern Ireland) and the Nordic countries (Finland, Norway and Sweden submitted WPs focussing on the Science and technology review for the BWC. The US too submitted working papers on strengthening confidence building and consultative mechanisms under the Biological Weapons Convention. Another important WP was submitted by France, on the Specificities of the Response to Natural and Intentional Disease Outbreaks.

Two issues dominated the April PrepCom meeting: proposals relating to the issue of a science & technology review mechanism and a renewed call for a more effective inter-sessional process. However, the August meeting is anticipated to be more exciting

where the ISU is charged with preparing papers on topics like 'history and operation of the confidence-building measures' agreed and revised so far at the previous Review Conferences (2nd, 3rd and 7th RevCons), the financial implications of proposals for follow-up action after the Eighth Review Conference; the common understandings reached by the Meetings of States Parties (MSPs) during the last intersessional programmes (2012 to 2015), and the status of universalization of the Convention.

Chemical Anarchy: Islamic State, Chemical Weapon and Syrian War Theatre

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Summary

There has been an increase in speculations surrounding the possible use of chemical and biological weapons in the aftermath of Paris massacre. These fears and speculations are not random or isolated. They emerge from events in the war theatres of Iraq and Syria that witnessed increasing use of chemical weapons such as chlorine and mustard gas against civilians and military alike across the globe after the outbreak of Ebola virus.

Some big questions following the aftermath of Paris massacre are two-fold. Firstly, whether the so called Islamic State (IS) would now look to acquire capability to develop or use strategic weapon systems, including those that are chemical and biological in nature, to overcome its conventional military inadequacies in Iraq and Syria; and if the IS would venture out with these insidious weapon system, especially chemical weapons, to attack foreign capitals. The answer is far from negative.

Arguably, speculations are rife among international experts, including those serving in the French and US governments, about the possibility of Chemical and Biological weapon attacks. French Defence Minister Jean-Yves Le Drian has said that a chemical or biological weapon strike is among the risks emanating from the IS. The French prime minister too expressed similar apprehension few days ago.

Earlier, both Iraqi and US intelligence officials claimed that the IS group (ISG) is aggressively pursuing the development of chemical weapons. Talking to the Associated Press, they claimed that the ISG had already set up a centre with a team of scientists to research and experiment the weapons.

These fears and speculations are not random or isolated, rather stemmed out of events in the war theatres of Iraq and Syria that witnessed increasing use of chemical weapons such as chlorine and mustard gas against civilians and military alike.

CW incidents in Syria¹:

The United Nations and Organisation for the Prohibition of Chemical Weapons (OPCW) have already confirmed the indiscriminate

use of chemical weapons against civilians in the on-going Syrian Civil War. Host of independent agencies and other sources active on the ground too have verified these events. In the last few years, there have been many blatant cases of chemical weapon attacks. Some of these incidents have been investigated and confirmed by leading world agencies like the United Nations High Commissioner for Refugees (UNHCR) and Human Right Watch, while some other cases remain controversial or under-reported.

The most deadly attack took place in Khan al-Assal and in Ghouta between March - August 2013, in Syria where various estimates suggest that no less than a couple of thousand people died and scores bore the brunt of the deadly gases.² The UN and Russians led separate investigations and confirmed the use of Sarin nerve agent and chlorine in both the attacks; they could not, however, ascertain the perpetrators of the crime -- whether it was the government that was behind these attacks or the rebels or militant groups.

Almost two years after Khan al Assal incident, which took place on March 19 (2013), once again the spectre of chemical weapon returned to haunt inhabitants of Sarmin (Idlib province) in the northwestern Syria.³ There were allegations and counter allegations regarding this. Syrian opposition group claimed that Bashar al-Assad's government carried out the chlorine gas attack in Sarmin, while the Syrian regime denied any such acts.

It is a widely known fact that the previous regime in Iraq and the present Syrian government are known to have stockpiled chemical weapons in their military arsenals. Whether these state controlled arsenals are falling in the hands of the IS or other militant factions presently engaged in a prolonged civil war in the region is largely unknown.

However, reports suggest that the IS has seized large swathes of territory both in Syria and Iraq and is feared to have controlled the remnants of CW stockpiles and infrastructures.

Even though Syria joined the OPCW, the international implementing body of the Chemical Weapons Convention, following the deadly Ghouta attack and declared its chemical weapon arsenal, which were destroyed subsequently under international supervision, many fear that Syria still has undeclared arsenal, especially chlorine. Syria didn't include chlorine stockpiles on its list of declared chemical weapons, as it does not fall under weapon category.

Islamic State's Chemical Jihad?

The claim from the IS side regarding the possession of chemical weapons, such as Mustard agents, came in late August this year from a Dutch soldier turned ISIS fighter identified as Omar Yilmaz, who indicated that the group has acquired chemical weapons once belonging to Syrian President Bashar al-Assad. Yilmaz's revelations came with a series of suspected incidents of mustard gas attacks in northern Iraq and Syria.⁴

Independent sources such as Conflict Armament Research (CAR) and the Syrian Observatory for Human Rights (SOHR) have claimed that the IS has used chemical weapons several times against Kurdish forces between January -June 2015. In August this year, the German Defence Ministry too reported IS's chemical weapon use in Erbil in Iraqi Kurdistan. The same month, the United States officials stationed in Iraq claimed that ISG have used sulphur-mustard in a mortar attack on Kurdish forces in Makhmour town located in Northern Iraq. The location has been in the news and a battlefield between the Kurdish forces and the Islamic State.⁵

A month after, US agencies found leads to show that ISG is making and using crude chemical weapons such as mustard agents in a powder form in Iraq and Syria. In September, a senior Russian Foreign Ministry official informed that Islamic State group has obtained the scientific documentation necessary to produce chemical weapons. According to Hakim Al Zamili, the head of the Iraqi parliament's security and defence committee, IS has been working towards production of chemical weapons, particularly nerve gas.⁶

Outlook

Numerous indications of IS having used CW notwithstanding, there are doubts or unanswered questions about its capability to conduct or unleash any large scale chemical weapon attacks in Western countries or even within its territory against rival fighting forces. However, if the Islamic State finds psychological or physical effectiveness of chemical weapons, by perpetrating mass fear and disruption, its use against western targets or civilian populace in European capitals or elsewhere would be a reality soon.

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News Analysis: Chemical Substance Attacks in Afghan Schools

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Summary

In the two months of April and May (2012), over a hundred schoolgirls and teachers were affected by poisoned drinking water and contaminated air at these high schools. Periodic attacks against students, teachers and schools using various methods are in practice since the Taliban was ousted by the US led allied forces.

Afghan Taliban's campaign against female education and empowerment is well known. This campaign reached new heights when unidentified poison attacks occurred targeting several girls schools located in Kapisa and Parwan provinces in April-May 2009. These attacks involved poisonous chemical substances and the victims had complained of headaches, nausea, vomiting, itching in the eyes following exposure. Again, in mid 2010, incidents of poisoning came to light in the Afghan capital, Kabul including in Esmati High School. Similar incidents have been noticed in 2012 as well. During same months of this year the reported attacks have occurred in many girls high schools including the Naheed Shaheed Girls High School and Bashirabad High School in the Takhar province. In the two months of April and May, over a hundred schoolgirls and teachers were affected by poisoned drinking water and contaminated air at these high schools. Unidentified toxic powder was used to contaminate the air in the classrooms as well as the drinking water source of these schools.

Periodic attacks against students, teachers and schools using various methods are in practice since the Taliban was ousted by the US led allied forces. In the past, Islamic radicals resorted to acid attacks against women and girls who were seen either in market places or going to schools. Additionally, there are reports of schools being bombed or burned down. The former Taliban regime in Afghanistan had banned any form of female education terming it against Islamic practice. Now out of power, these elements have been trying to implement their writ in the areas located in North East of Kabul where they continue to maintain dominant positions and where insurgency draws support from the local Pashtuns. According to the Afghan ed-

ucation ministry, extremists associated with Taliban have forcibly close down more than 500 schools in 11 provinces in which it has strong support base.

The head of Takhar's public health department confirmed in a media report that the attacks are intentional acts aimed at poisoning schoolgirls. Even though the officials were silent, largely due to fears of retribution, fingers point to pro-Taliban elements that have always been opposing female education. Thus, this act seems to be aimed at spreading fear amongst the people of the localities. Authorities also believe that this could be a part of Taliban's annual 'spring-summer offensive'.

However, from a larger perspective, two things remained unclear so far and need proper investigations by authorities: the identification of substance used and the source of the chemical.

Zabiullah Mujahid, the known Taliban spokesman denied Taliban's role in the gas attacks against girl schools in the past. After the Esmati High School incident in Kabul in August 2010, Zabiullah Mujahid said: "We have not and will never take such action against innocent girls." Even in the aftermath of latest attacks, Taliban denied carrying out such attacks. Zabihullah Mujahid told the BBC News that the Taliban condemn such actions. He reiterated that the Mujahideen of the Islamic Emirate of Afghanistan (Taliban) are not involved in these alleged incidents. Meanwhile, Afghanistan's intelligence agency, the National Directorate for Security (NDS), has accused the Taliban group for poisoning and reportedly has apprehended some suspects having links with the Taliban. Investigating reporters active in the region also believed that the chemical gas attacks are very much unlikely and this could be part of some mass hysteria or a conspiracy to cripple the education system. Ac-

ording to NDS officials, one detained Taliban commander reportedly claimed responsibility behind the transportation of non lethal chemical materials from the bordering regions of Pakistan and confirmed about a complicity of insiders who assisted the militants to transfer the Chemical material inside schools.

In the case of chemical substance attacks against schools, the intent seems not to kill any girl students but plausibly to deter their parents and students from attending schools. It could also be the case that as Taliban's core does not have full control of affiliated or local groups, it is possible that hardcore elements perpetrated those attacks or conspired with insiders to achieve their objective without the knowledge of senior leadership of Taliban.

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Weapons of War: State Actors and Chemical Weapon through the Years

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Summary

Throughout the history of warfare attempts have been made to use chemical agents as weapons of war. Most attempts were unsuccessful until the growth of the chemical industry during the latter-half of the 19th century. By the outbreak of World War I in 1914, the first military chemical agents were already in the arsenals of the major powers.

Like the other weapons of mass destruction, Chemical warfare agents (Chemical weapons-CW) have all the appalling elements which represent a serious danger to the living beings at large. Countries like the US, UK, China, Russia, Iraq and Libya were the pioneers in the field of chemical weapons research and production in the world. As a matter of fact, any country which possessed a well-developed chemical industry could produce chemical agents for warfare purposes. Presently, large numbers of industrialized countries have the potential to produce a variety of chemical agents.

Chemical warfare agents have been defined in a report authorized by the United Nations General Assembly as “chemical substances, whether gaseous, liquid, or solid, which might be employed because of their direct toxic effects on human, animals and plants.”¹ These toxic chemical agents (CWs) may be used to accomplish a wide variety of military missions. Tagged as ‘search weapons’, the CW agents are able to penetrate shelters, buildings, trenches, bunkers and other types of military fortifications; they are also capable of inflicting casualties over large areas without damaging vital economic and military infrastructures. Chemical weapon agents are largely invisible and indiscriminate in their effects and offer a prospect of killing or incapacitating enemies and civilians. This category of insidious weapons generates more fear than any other conventional munitions; could very well terrorize civilian populations and demoralize any ill-equipped and exposed military units.

CWs in World Wars

Throughout the history of warfare attempts have been made to use chemical agents as weapons of war. Most attempts were unsuccessful until the growth of the chemical

industry during the latter-half of the 19th century. By the outbreak of World War I in 1914, the first military chemical agents were already in the arsenals of the major powers. The French were the first to use chemical agents in the form of tear gas grenades against the Germans, who defoliated with tear gas artillery shells. Their effect was minimal, mainly due to a complete lack of understanding of how to utilize such weapons. On April 22, 1915, the Germans launched a chlorine gas attack against British and French troops at Ypres resulting in 5000 deaths.² The second major development was the use by the Germans of mustard gas and phosgene at Verdun in 1917. The persistence of this agent and its effects were such that in a few months the number of British casualties reached 125, 000, one third of the total British gas casualties for the whole war.³

The only incidents involving the actual use of gases between the world wars were in 1936, when the Italians employed a type of mustard gas against the Abyssinians (Ethiopians), and several occasions in 1937 and 1945, when Japan attacked China. About 50,000 Ethiopian army fatalities were caused by chemical weapons during the Italian invasion. It is stated that the Italians used mainly vesicants and asphyxiants.⁴

The use of gas against Chinese civilians was extensive between 1941 and 1942. When Chinese peasants took refuge from the invaders in the caves and tunnels, the Japanese troops used chemical agents to drive them out. In May 1942, Japanese soldiers are said to have discharged gas into the tunnels, killing some 800 Chinese people.⁵ After World War II, there have been numerous reports of the use of poison gas in warfare. The first was in Korea and China in the early 1950s. It was claimed that in May 1951, one B-29 aircraft attacked the city of Nampo (North Korea) with gas bombs. As a result, a thousand people were affected and

nearly 50% died of suffocation.⁶ Again in July, August and in January of the next year, US planes were said to have spread gas in Won San and Hwanghai. However, the casualties and damage done by these attacks were not known.

CWs in the Post World War Era

During the 1963-67 civil-wars in the Yemen between the Royalist regime and the Republican authorities, allegations were made that lethal gas was used by Egyptian forces. It was alleged that gas had killed people and animals by asphyxiation in Kitaf (North Yemen) in January 1967.⁷

Chemical agents were used on a large scale as defoliants to remove jungle growth and prevent their use as cover for guerrilla activities in Indo-China in 1960-70. After this, it was left to the Iran-Iraq conflict to spawn yet another round of large scale use of chemical weapons in war. The war showed definite evidence of the employment of nerve and mustard agents in the Persian Gulf War during 1980-88. It is necessary to discuss at length the massive use of chemical agents in these two above mentioned wars, not only because of large-scale employment of chemical agents but also because of its devastating effects on ecology and mankind. Also the curious case of Libya needs special mention here which secretly stockpiled CWs even after declaring and destroying some of them as per international obligations.

Beginning in 1961, the United States started the “experimental” use of herbicides in South Vietnam as a weapon to exterminate forests and crops. The initial objective was to undermine the economic resources of the national liberation movement. In 1962, defoliants became a central weapon in overall chemical and biological warfare strategy of America throughout South-east Asia. Estimates suggest that between 1965

and 1970, more than 50,000 tons of herbicides were dropped on South Vietnam alone.⁸ Although the operation began with the intention of merely destroying the economic base of the National Liberation Front (NLF), it was soon expanded into a critical aspect of the shift from ground to air power in South Vietnam. Besides destroying crops, defoliants were used to destroy the forest canopy that hid NLF Forces from detection by air.

The major anti-plant agents that were employed by the United States in Indo-China were 2,4-D, 2,4,5-T, cacodylic acid and picloram. The agents used have been described in two classes, herbicides and defoliants.⁹ Most of the anti-plant chemicals were dispersed from C-123 transport aircraft equipped to deliver somewhat over 3600 litres. Some were dispensed from helicopters, and others by truck and boat-mounted spray rigs. Official American reports state that from 1961 only five million acres of land were sterilised. But Vietnamese statements contend that in the first two months of 1969 alone, some 37 of the 44 provinces of South Vietnam were sprayed, contaminating 285,000 people. At least 500 people died. In these raids more than 905,000 hectares of rice, orchards and other crops were destroyed. Between late 1961 and October 1969, it is estimated that 43 per-cent of the arable land and 44 per-cent of the total forest area of South Vietnam were sprayed at least once and in many cases two or three times with herbicides. Over 1,293,000 people were directly contaminated.¹⁰ Due to this, agricultural productivity has been severely curtailed in many regions. The delta area of South Vietnam, once considered the rice bowl of South-east Asia, became an importer of rice from foreign countries.¹¹ Besides defoliants and herbicides, more than 7,000 tons of other poisonous gases were used between 1964 and 1969.

Both Iran and Iraq used poison chemicals a number of times during the course of war between 1980 and 1988. By 1983, Iraqi production of mustard gas was sufficient for Iraq to begin to deliver small amounts with artillery, fighters, and MI-8 helicopters. It is unclear exactly when Iraq developed bombs using chemical agents, but it seems to have used 250-kilogram bombs bought from Spain.¹² In comparison to Iraq, Iran seems to have begun a crash effort to acquire an internal production capability in 1983-1984. These efforts began to pay off in 1986-1987. Iran began to produce enough lethal agents to load its own weapons. Like Iraq, it could produce blood agents like hydrogen cyanide and phosgene gas.

It was alleged by Iranian governmental agencies that by the autumn of 1984 Iraq had used chemical weapons in more than 130 instances since the beginning of the Gulf War in 1980, killing or injuring at least 3500 people, including non-combatants.¹³ On March 12, 1985, within a few hours of the opening of the long-expected Iranian offensive across the Hoveyze Marshes, the official Iranian news agency announced that Iraq intended to use chemical weapons. Over the next four weeks, according to Iranian reports, there were 32 further attacks in which 4600 Iranians were killed or injured by chemical weapons.¹⁴

Iraq continued to use chemical agents in its war with Iran. During the second week of February 1986, around 10 percent of a large Iranian force attacking Faw became casualty to chemical weapons; some 2000 people are said to have been burned with mustard gas on February 13 alone.¹⁵ In mid April 1987, it was alleged that Iran used mustard, tabun and phosgene in artillery shells against Iraqi forces on the Southern Front causing 385 casualties.¹⁶ This was denied by the Iranian government. Iraq made massive use of chemical weapons during its re capture of

Faw in early 1988 and in its assaults to recover its positions outside Basra. By April 1988, Iran claimed that the new round of attacks had raised the total number of casualties from chemical weapons since the start of the war to around 25,600, with some 260 dead.¹⁷ During the final months before the cease-fire, Iraq used chemical weapons in its attacks on Iranian positions in Mehran, the Majnoon Islands, the Hawizeh Marshes and Deh Loran. The worst single use of gas against civilians occurred at the village of Halabjah on 16 March 1988 when mustard gas and nerve agents were used to kill up to 5,000.¹⁸

The other example is Libya which produced chemical weapons during the 1980s, and is suspected to have used CWs against Chadian troops in September 1987.¹⁹ The notorious Rabta industrial complex (located southwest of Tripoli) produced mustard gas, sarin, and phosgene. The Gaddafi regime declared possession of at least 25 metric tonnes of mustard agent and 1,400 metric tonnes of precursor chemicals, which are used to make chemical weapons.²⁰ Even though the Rabta remained inactive and Libya destroyed some chemical weapon artillery shells under the supervision of the Organization for the Prohibition of Chemical Weapons (OPCW), it is now come to light that the just ousted Libyan regime has stockpiled CWs secretly, in an apparent breach of promises made in 2004 when Libya joined the OPCW.

Conclusion

The intentional use of chemical weapons in Vietnam has set a dangerous precedent. Though some have gone so far as to describe it as a valuable experiment in ecology, it must be considered as one of the most irresponsible and criminal acts of the century. This so-called experiment led to a major proliferation of chemical weapons, especially in the Third World countries,

where chemical weapons are considered a “poor man’s” nuclear weapon. Most of these countries argued for the production and stockpile of CWs only because of the idea of a chemical weapons stockpile as a deterrent. The production and use of chemical weapons for the Iran-Iraq war and the case of Libya’s secret CW arsenal demonstrated the proliferation and capability of State actors to produce militarily significant arsenals of weapons of mass destruction.

However, this proliferation of chemical weapons was not confined to nations alone. The ability of terrorist groups and individuals to disseminate chemical weapons is an issue of considerable concern in recent times. The 1995 Japanese subway attack demonstrates this ability when the religious cult Aum Shinrikyo used lethal sarin nerve gas in a busy subway in Tokyo, killing and injuring many people.²¹ This development aptly reflected the availability and danger of CWs in the hands of terrorist groups as well as rogue states.

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State Actors and Germ Warfare: Historical Perspective

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Summary

The old arguments against the effectiveness of biological warfare still apply. The effects of novel organisms would still be delayed, unpredictable, and difficult to control. In military terms, any advance is almost certainly not a matter of the routine use of biotechnology. Whatever the fact, this double edged weapon still acts like a deterrent against any kind of conventional attack. Empirical evidence suggests that the likelihood of such a war between technologically advanced states is remote as since 1945, the biological weapons have been used only in situations where the victims were unprotected and unable to retaliate.

Two thousand years ago the Greeks and Romans used human and animal corpses with great effect to poison wells of drinking water. The practice of throwing the bodies of plague victims over the walls of cities was also prevalent in the past. This strategy was employed by the Tartars against the Genoese in the Crimea War in 1346. It forced the Genoese to flee immediately and the spread of the disease to Italy became inevitable. Four centuries later infected bodies were used against besieged cities in the Russo-Swedish War of 1710.¹ Another method was employed by the British in their war against the American Indians, known as Pontiac rebellion (1763). Two hostile Indian Chiefs were given two blankets and a handkerchief, infected with the smallpox virus, as gifts.²

No nation has used germs intentionally and successfully against the personnel of another rival nation in the 19th century, though the Germans had injected the horses of Romanian cavalry with 'glanders' in 1914.³ Some allegations were made during World War I that the horses exported from America to Europe had been infected with diseases.⁴ Since then a great deal of research and experiment was devoted by various states to perfecting various techniques of use of living pathogen broadly speaking, biological weapon (BW). Post-war research was largely a continuation of Japanese, German and British policy during the World War II. The Germans, however, did not go beyond the stage of experimentation and sometimes war prisoners (PoWs) were subjected to the tests.⁵ The British had been concerned that the Germans might use biological weapons and consequently launched an intensive research programme. Britain's military was even putting together a bombing plan for the use of anthrax against six German cities: Berlin, Hamburg, Stuttgart, Frankfurt, Aachen, and Wilhelmshaven.⁶

Japanese effort at using bio weapons during 1936 to 1945 was more coherent and effective. It was far more serious and fully substantiated. Large areas in China were used as testing grounds. Sabotage was also examined as a possible means of use of biological weapons. The preparations had reached the stage where a factory for the production of bacterial toxins, vectors and other means for prosecuting biological warfare had been built at Harbin in Manchuria and the programme was carried out in great secrecy.⁷ In 1949, the use of biological warfare was probed during the trial of 12 Japanese prisoners of the Kwantung Army at Khabarovsk, USSR. The details of the trial were published in 1950. It took 27 years to confirm that the Khabarovsk incident was true.⁸ It now appears that, in the course of testing potential biological weapons, the Japanese scientists experimented on more than 3,000 human guinea pigs and they were mostly Chinese and Russian prisoners of war. Hiroshi Akiyama, who claimed to have been a witness, alleged that 1500 to 2000 prisoners had died in these experiments.⁹ The Harbin installation was destroyed by the Japanese before the Russians could capture it.

On 8 May 1951, allegations were made at the United Nations by the North Korean Government and further allegations were made in 1952, together with a statement by Zhou Enlai, then Chinese Foreign Minister, that biological weapon attacks had been made over north-east China. All these allegations were against the US. The charges referred to specific incidents involving insects and plant-pathogens. In 1952, an independent commission, The International Scientific Commission (ISC), was set up and invited to Korea and China to conduct the necessary investigations.¹⁰

The report of ISC mentioned the use of disease agents like plague, pulmonary anthrax, encephalitis and cholera. In the

report the first disease discussed is plague. According to the information, for the past five centuries there had been no plague in Korea. Its appearance was a recent phenomenon. Human fleas infected with plague were alleged to have been found. Another case that the Commission considered took place in Kan Nan. This referred to the use of voles as carriers of plague infected fleas.¹¹ The next case discussed in the report concerns Anthrax which was allegedly spread in Kuan-Tien by anthomyiid fleas and spiders. These were found close to the bombs. Among other cases of anthrax in Liaotung and Liaohsi, a Ptinid beetle was found to be vector, allegedly found in large numbers.¹² Some eye-witnesses were examined by the commission. Several people had contracted respiratory anthrax and were subjected to post-mortem pathological investigation. Another incident referred to was the use of infected clams in Dai Dong. These allegedly carried cholera. Marine clams were found on a hill side by a peasant woman near a reservoir. They were wrapped in a straw. After eating the clams she and her husband died of cholera.¹³

The techniques of dissemination were also examined by the Commission. The Commission relied to some extent on the evidence of the captured US Airmen. Though spraying was the most feasible technique reported, it was believed that a paper package with hardy insects might have been dropped from a height. Another munition mentioned by the Commission was the *air-bursting variable-time fuse leaflet bombs*. These were allegedly used in many cases for insect dissemination. Though the Pentagon denied the charges, it was possible for the US to disseminate bacterial toxins through this method.

The casualties reported in Korea, though, were not clear. It is evident that a plague epidemic broke out at Bal-Nam-Ri. Out of a

population of 600 in the village, 50 were infected with plague and 36 died.¹⁴

Since 1960, there were a number of occasions when biological agents were used. In the summer of 1961, an English-language newspaper in Hong Kong, the 'South China Morning Post', reported a cholera epidemic in the South east of Kwantung province. It had accused agents of the American bacteriological warfare bureau of plotting the cholera epidemic.¹⁵ But the accusation was rejected by the US Department of State. The same allegation was made by Cuba in 1964.

But in the Vietnam War of 1960-68, the most horrifying aspect was the use of biological warfare agents by the United States. In order to reduce the chances of detection, strategic applications against the population required the use of highly epidemic agents which would not spread over large areas. This strategy was applied by the US in Vietnam. In Vietnam, only one agent was thought to be likely to be of use, namely, the Pneumonic Plague, a highly lethal, highly epidemic disease restricted previously to a few river valleys. It is alleged that the United States decided to conduct a biological war against Vietnam, and this is evident from the report of the World Health Organisation (WHO).¹⁶ Direct injuries caused by weapons were by no means the only health disasters brought about by the Vietnam War. Contagious diseases were spread in epidemic proportion within South Vietnam. On 26 October 1966, WHO announced that by October 1966, 306 cases of plague including 22 deaths had been reported in South Vietnam. In all, it was the suspected cause of 2158 cases and 107 deaths.¹⁷ The report further stated that cases of plague had been reported from 24 out of 47 provinces in the South, and plague infections had been found in rodents in several ports and airports including Saigon, Nha Trang, Cam Rahn and Da Nang.¹⁸ In South Vietnam, cholera

increased by hundred per-cent with other intestinal diseases.

The germ warfare report was confirmed by an executive of the New England firm, Traveller's Research Corporation of Hartford, Connecticut. He said that the firm had contracted a project from the Defence Department to adapt bubonic plague for aerial dissemination in South Vietnam.¹⁹ The contract was a crash programme to produce large quantities of the bacilli that induce plague and tularaemia.

Though there were no official charges in all these cases, there have been specific allegations that biological weapons were used against vegetation. According to the North Vietnamese News Agency report of 17 October 1966, some larvae of killer insects were let loose on September 1966 on the Cham Thanh district of Tan province. Route 21 from Duong Zian Hoi to Vinh Cong was affected. All the rice, plants, fruit trees and orchards in a band of 2 kilometers were destroyed.²⁰ Similar incidents had apparently occurred in mid-August in the villages of Huong My, Minh Duc and Cam Sun in the district of Nycay, Mekong Delta. Around the village of Huongny, 40 hectares of young plants were killed. However, in comparison to chemical weapons in Vietnam, the use of biological weapon was less in volume and effect.

The US was not the only one accused of using biological weapons. It is alleged that the erstwhile Soviet Union supplied biological weapons, mainly fungal toxins (Mycotoxins) to government forces, to kill dissident tribal people and enemy soldiers in Laos, Cambodia, and Afghanistan. Though the charges were denied by the Soviet government as well as by the other governments involved, the first major public pronouncement on the subject was made by former US Secretary Alexander Haig on 13 September 1981. He claimed that the US had

obtained good evidence that in addition to a traditional lethal chemical agent, three potent Mycotoxins had been used. The evidence came from the analysis of leaf and stem samples from Cambodia which revealed the use of high levels of mycotoxins. The levels detected were up to twenty times greater than any natural outbreak.²¹ Reports of incidents in which fungal toxins were being used against Laotians and Cambodian villagers became more numerous between 1979 and 1981.

The two major publications on mycotoxin weapons were issued by the US State Department in 1982. The first report referred to 261 separate attacks in Laos in which 6,504 deaths are alleged to have occurred and 124 attacks in Cambodia causing the death of some 981 persons.²² The second report issued by the US State Department alleged the use of mycotoxins and provided the results of analyses on blood and urine samples obtained from the victims. Again by analysis of two contaminated Soviet gas masks acquired from Afghanistan the evidence of mycotoxins use was confirmed.²³ Casualties caused by mycotoxins use are not known in Afghanistan.

The old arguments against the effectiveness of biological warfare still apply. The effects of novel organisms would still be delayed, unpredictable, and difficult to control. In military terms, any advance is almost certainly not a matter of the routine use of bio-technology. Whatever the fact, this double edged weapon still acts like a deterrent against any kind of conventional attack. Empirical evidence suggests that the likelihood of such a war between technologically advanced states is remote as since 1945, the biological weapons have been used only in situations where the victims were unprotected and unable to retaliate.

Endnotes

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- ¹⁰ *Ibid.*, p.57.
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Taliban and Weapons of Mass Disruption Threat

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Summary

The article analyses the Tehrik-e-Taliban Pakistan's threat of use of chemical weapons inside Pakistan. It looks at the recent such instance of possible low scale use of chemical agents and argues that the recent threat is more of tactical nature.

In Late 2009, the Tehrik-e-Taliban Pakistan (TTP), the radical umbrella terror group operating Pakistan, had threatened to unleash a chemical warfare against Pakistan and planned to use the age old tactics of mass disruption by poisoning Multan, Karachi and Rawalpindi water supplies. According to Pakistan's intelligence agencies, the Taliban presently cornered in their own tribal strongholds, planning to use 'cyanide' and other poisonous chemical substances to the water supply lines in these cities. A faxed threat- letter was received by the Rawalpindi Directorate of Military Lands and Cantonment sometimes in November and as per the letter and other Intel inputs, Taliban has already procured and stockpiled 200 liters of poisonous material that would be used to contaminate water sources and reservoirs under Rawalpindi and Chakla cantonments and perhaps in Karachi. Early in November 2009, Multan administration has directed the concern authorities to stop supplying water to the people from storage tanks after receiving inputs about the Taliban's threat.

In April 2009 Pakistan's North West Front Province (NWFP) police chief Malik Navid told a Pakistan National Assembly's standing committee about Taliban's expertise in making chemical and biological weapons. Navid warned that the Pakistan government needed to urgently focus on containing militancy as it spread from its bases. Navid's testimony also highlighted the merger of al-Qaida and Taliban in AfPak region.

In April-May 2009, Afghan Taliban who have been campaigning against female education of any type, had targeted several girls schools located in north of Kabul in Kapisa and Parwan provinces. These attacks involved poisonous chemical gas and the victims complained of headaches, nausea, vomiting, itching in the eyes. Nearly two hundred students and teachers were affected in these attacks. However, no casualty reported and all of the victims were released shortly after treatment. Though the specific type of gas used remains mysterious it is suspected that Taliban and al Qaeda elements must have experimented with either chlorine or white phosphorus.

- April 26: Over 40 students and teachers were rushed to hospital after a militant suspect lobbed a bottle into the Sadiqi Padshah girl school premise in Charikar town in the Parwan province.
- May 11: Around 60 girl students in another school (Ura Jalili Girls' High School) located in Charikar town (Parwan province) went to the hospital after a similar gas attack with complaints ranging from headaches, dizziness and stinging eyes, with several girls losing consciousness.
- May 12: Chemical gas attack took place at the Qazaaq school in After Bache locality in Mahmud Raqi, capital of Kapisa province. Nearly 130 people were affected, with 98 students and 6 teachers. Many of them were admitted in the local hospital.

Taliban, irrespective of AfPak locations, is not new to this whole war tactics of using weapons of mass disruption, especially chemical and biological weapons. They have Abu Khabab al-Masri's training of chemical and biological weapons handling and the guide book on the CB weapons use against potential targets. Masri (a.k.a Midhat Mursi al-Sayid Umar), believed to have headed al-Qaeda's Weapons of Mass Destruction (WMD) program 'Project al-Zabadi. According to experts and various reports, al-Masri provided Afghanistan Taliban poisons and explosives training in his hideout at Derunta camp, near Jalalabad (Afghanistan). Derunta camp came to limelight when videotapes showing al Qaeda experiments poisoning dogs with chemical weapons surfaced in 2002.

According to al Qaeda observers Masri received his chemical weapons training in the Egyptian army before defecting to the militant Islamic Jihad group founded by Ayman al-Zawahri. The latest threat calls for a recollection of a statement issued by Al Qaeda top leadership. One such statement signed by Mustafa Abu al-Yazeed had warned that al-Masri had "left behind [...] a generation of faithful students who will make you suffer the worst torture and avenge him and his brothers." The CB

weapon threat continues even after Masri's still mysterious death.

Historically speaking, the Afghan Taliban had reportedly received its first supply of chemical weapons during mid 1990s from Pakistan during its battle against then Afghan government. However, there is no concrete evidence to prove these reports.

Now Pakistan security agencies cannot ignore the water poisoning threat as Taliban's Afghan counterpart has already experimented chemical weapons. In what can be termed as scare tactics, TTP now intends to pressurize the Pakistani army to stop military operations in Waziristan. Issuing the water poisoning threats to the Rawalpindi and Chakla Cantonment Boards, it seems they aim to spread panic among the Armed forces presently engaged in the war in the tribal region, clearly sending out a message that their family back home is not safe from Taliban's wrath.

Is Bioterrorism Threat Credible?

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The big question is whether the threat of biological weapon use is real or a product of fearful future thinking? As far as terrorist groups are concerned, they not only wish to survive, but endeavor to thrive with continuous innovation and improvisation. The paucity of empirical data on terrorist use of biological weapons does not limit their future planning concerning biological weapon.

Even terrorists play pranks on WMD use these days! Late May 2008 a purported terrorist video caught media attention and some serious coverage. As per the reports, the Al Qaeda video message urged Islamic jihadists to use “biological, chemical and nuclear weapons to attack the West.” Experts suspecting the authenticity of the video message dismissed the threat as a prank and not ‘*Qaedaesque*’ enough to get scared.¹

Much water has been passed since the anthrax scare which had taken its limited toll against the most powerful country on earth immediately after the events of 9/11 terrorists events in the US. Though limited in its spread, experts have concluded that the worst situation would arise mainly due excessive human interference in the natural process of life. A substantial part of the threat also constitutes the malign use of naturally occurring organisms (biological agents) by mankind in general and terrorists in particular. There are many factors that attract a terrorist group towards biological weapons and biological weapons attack. Most important is their toxicity. In addition, their un-detectability and capacity to reproduce rapidly make biological weapons a weapon of choice for terror groups.

Biological Weapons Use: Real Time or Futuristic

The big question is whether the threat of biological weapon use is real or a product of fearful future thinking? Plausibly enough, we are passing through a time where innovation is the key to survive. But as far as terrorist groups are concerned, they not only wish to survive, but endeavor to thrive with continuous innovation and improvisation. Trends show that terrorists in South Asia, particularly in India, have always improvised their tactics and methods, be it in suicide attacks, serial blasts, handling improvised explosives using pressure cookers, hurling grenades recruiting unemployed civilians or in choosing targets (temples, Mosques and busy market places).² And if intelligence reports are to be believed,

they have graduated to snipers for targeting high-profile political or business personalities in India. In the face of this continuous up-gradation of terror tactics, use of biological weapon or deadly pathogen by terrorist groups or a 'lone wolf' into civilian population or targeting individuals, might be probable.

Equally imperative to note is the nature of the biological weapon agents. Biological weapon could be lethal in the hands of non-states actors like terrorists, religious cults, and Mafia syndicates. International terrorist outfits like Al Qaeda have made unexpected efforts in developing bio-weapon capability among other weapon of mass 'disruption/destructions (WMD) in the past and possibly, are doing so even now.

Historically, no terrorist group or religious cults achieved success in employing biological weapons or live pathogen at a large scale. However, there are ample evidences of the use of biological agents by some groups with little success. These attempts managed to scare and disrupt the society at large.

In 1984, the Rajneesh cult in Oregon, US, intentionally and indiscriminately contaminated a number of salad bars with a strain of salmonella bacteria. Over 700 people got affected with gastrointestinal illness, though nobody died in this incident. The cult members used commercially available biological agents to incapacitate people. Their aim was to win voters at bay during the local election. In 1994, a Japanese group called the Aum Shinrikyo unsuccessfully attempted to spread botulinum toxin and other agents in the city, before committing the dreaded subway Nerve gas attack. In 1998, a microbiologist linked to white-supremacist groups in the US had threatened military-grade anthrax in Las Vegas. His threat though later turned out to be harmless; generated widespread fear within civil society and security forces. The other important case occurred in post 9/11 terrorist strikes. Anthrax laced letter attacks causes five deaths and more than 15 people were severely ill. Unlike most other pathogens, anthrax is considered to be most potent and virulent. In 2003, at least four Ricin related incidents took place. In the beginning of the year, on

January 5, 2003, six Algerians, believed to be part of the 'Chechen network', Ansar al-Islam, a group linked to Al Qaeda and Iraq were arrested during a raid on a flat in Wood Green, North London, by the British security agencies. They were in the possession of Ricin. Castor seeds and equipments to make Ricin were also recovered from the flat. In March, traces of Ricin were found by the police in two phials inside a locker at Gare de Lyon railway station in Paris. On October 2003 a metallic container with Ricin was discovered at a Greenville, postal facility in South Carolina, United States. A November 2003 disclosure confirms that traces of Ricin were also found in mail bound for the White House. No one was hurt in any of the four cases, fortunately.

In South Asia, Tamil rebel groups had threatened to use biological materials against the native Sinhalese in the early 1980s. The rebels threatened to spread Bilbariasis and Yellow Fever in the country and allegedly laid out plans to attack rubber plantations and tea gardens using anti plant agents. Again in Sri Lanka, recently in March 2008, this scare tactic surfaced when the UN Department of Safety and Security, located at Baudhdhaloka Mawatha, Colombo, issued one intra organisation advisory following the receipt of suspicious packages with powder substance at one of the government agencies in Colombo. The suspicious packet was comprised of a threatening letter which contained a white powdery substance.

There are recent reports that Al Qaeda's Abdur Rauf, a Pakistani microbiologist has searched every corner of Europe to obtain anthrax spores and equipment for Al Qaeda bio-laboratory in Afghanistan to weaponise the pathogens, much before 9/11 events. Not to forget Menad Benchellali's covert activities and his quest to weaponise Ricin, before his arrest in early 2004, in his bio/chem laboratory in Lyon, France. Benchellali, an Al Qaeda trained terrorist, was convicted in 2006 along with 24 others. His handling of bio/chem material in small laboratory and expertise under terrorists' disposal opened a can of worms. Somebody has rightly pointed out that Benchellali's case had opened the door of secret world of bio-terrorism.

Why Islamist terrorist groups like Al Qaeda, are employing and indoctrinating scientists, trained microbiologists in its fold? The answer may be still unknown, but conventional wisdom suggests that there is a hidden design in place and that certainly involves intentional fiddling with life science and living organism. The picture is still hazy. The news about a couple of Indian origin doctors among others in their fraternity from Jordan and Iraq had been detained and suspected in connection with the foiled attacks in Glasgow and London last year might make the picture more clear.³ The attempted bomb attacks by trained doctors who have undergone life science and pathological laboratory training to save human life, now on a terror call, are certainly very disturbing. This is not all! Investigations into a terror web forum suggest that around 45 (all Muslim) doctors planned a consorted Jihad against the US.

Again, analysts have stumbled upon chemical and biological weapon manuals being circulated in Jihadi web forums over the internet. This finding makes the bioterror threat more plausible, even though, these openly available manuals can help terrorist to develop crude biological weapon with minimum lethal factor. A survey published by *Jane's Intelligence Review* (2007) indicates that chemical and biological weapons on password protected web forums constitute a part of jihadi discussion. At least two longer manuals on biological weapons have found in these Jihadi forums which describe methods for growing plague bacteria and botulinum toxin.⁴

Conclusion

Knowledge about the Aum Shinrikyo (Japan) and Rajneesh (Oregon, US) episodes is available, however one could only speculate the biological weapons capacity of international terror groups such as Al Qaeda's. This is perhaps to downplay the latter's reach and interests in acquiring and using them.

Of course, the intelligence community does not have the evidence about Al Qaeda or any terror outfit going beyond the initial exploratory. But the paucity of empirical data on terrorist use

of biological weapons does not limit their future planning concerning biological weapon. By leveling the whole bioterrorism issue as absurd would be too simplistic and immature on the parts of strategic thinkers or policy makers.

Knowledgeable observers opined that it is a matter of time car bombs would replace biological pathogen filled balloons, if not hi-tech delivery systems. Indeed, it is not very hard to stretch imagination on why five among the eight suspects have training in microbiology⁵ and working for Al Qaeda's Jihadi agenda. Opinion is still divided between the alarmists and those holding an imminent bioterrorism threat to be far-fetched. Though time and again this insidious threat has been downplayed by India's counter-terror mandarins citing non-existent earlier cases in this part of the world, it is just a matter of time to witness a germ unleash of apocalyptic nature.

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Protecting Homeland: US Biodefence Programme Post 9/11

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Reports of the US secret biodefence activities surfaced in 2001 and questions were raised regarding the nature of the following programmes: Project Jefferson, Project Bacchus and Project Clear Vision. A modest estimate shows that the US government has spent or allocated over \$ 40 billion since 2001, till the fiscal year 2008.

“Bioterrorism is (...) a threat to every nation that loves freedom. It’s important that we confront these real threats (...) and prepare for future emergencies.”

US President George W. Bush, 12 June 2002.

“Bioterrorism is a high consequence but low probability event.” While the debate over this statement continues to dominate national security discourse across the world, the United States of America (US) has been aggressively pursuing biodefence strategy to thwart any kind of threat emanating from a biological pathogen or weapon. Ever since Anthrax spores reached the US government offices through postal mails, the annual government spending on biodefence programmes increased manifold. The government has spent a substantial amount of its resources over the past six years to prepare and to protect the nation against any bioterrorist attack. This paper aims to discuss, or rather document, the emergence and growth of various national biodefence programmes with special reference to the US biodefence programme.

Historically speaking, the biodefence programme in the US was initiated in 1969 when the then President Richard Nixon ordered the destruction of all bio-weapons stockpile and terminated the offensive bio-warfare programme, under the directive of National Security Decision Memorandum (NSDM 35 and NSDM 44). Both the Memorandums outlawed offensive bio-weapon and toxin programmes respectively and authorized biodefence activities. This led to the establishment of the US Army Medical Research Institute of Infectious Disease (USAMRIID) at Fort Detrick, Maryland, primarily to continue the development of

vaccines and antibiotic research. Again, in the late 1980s, under Programmatic Environmental Impact Statement (PEIS) which covered biological pathogen research, testing and evaluation, the US government clarified that its biodefence programme does not include weaponization of biological pathogens, thus, professing transparency about its activities. However, there was a shift from the 'policy of relative openness to secrecy in the 1990s,' and the US biodefence programmes maintained a low profile. Reports of secret biodefence activities surfaced in 2001 and questions were raised regarding the nature of the following programmes: Project Jefferson, Project Bacchus and Project Clear Vision. The last two projects were undertaken by the Defense Threat Reduction Agency (DTRA) and the Central Intelligence Agency (CIA), respectively.

The US biodefence programme continued to remain covert until the advent of Project BioShield in 2003, which was pursued overtly with government sanctions. Project BioShield became a law in July 2004. Under the Project, efforts have been made to develop and make available effective drugs and vaccines to protect civilian population against any biological and chemical weapon attacks. This is a ten-year programme that aims to acquire medical countermeasures for civilian use, for which the administration appropriated \$6 billion for 10 years, to purchase countermeasures to achieve three primary objectives:

1. to expedite the conduct of National Institutes of Health (NIH) research and development on medical countermeasures (drugs and vaccines) based on recent scientific discoveries;
2. to give Food and Drug Administration (FDA) the ability to make new treatments available in emergency situations by establishing a fast-track system of safety approval and regulation for pharmaceutical companies; and
3. to ensure that resources are available to pay for "next-generation" medical countermeasures (drugs and vaccines) for Strategic National Stockpile programme, formerly the National Pharmaceutical Stockpile (NPS).

According to one conservative estimate, the biodefence spending and allocations since 2001 have reached approximately \$40 billion mark. Arguably, an increasing vulnerability towards bioterrorism, intentional use of disease causing pathogens by 'lone wolves' and natural outbreaks of emerging and reemerging infectious diseases post 9/11, prompted the Washington administration to devise plans to protect the civilian population at large. Hence, germinated the idea of protecting Americans from biological weapons. At least 18 Homeland Security Presidential Directives (HSPDs) have been passed since 2001 and among them, three are directly related to the country's overall biodefence efforts. They are: HSPD-8 on National Preparedness (December 2003), HSPD-10 on Biodefence for the 21st Century (April 2004) and HSPD-18 on Medical Countermeasures against Weapons of Mass Destruction (WMDs) (January 2007). The classified version of HSPD-10, which is conceived by the Homeland Security Council (HSC), elaborates the US biodefence strategy. It specifies the duties and roles of each federal agency involved in biodefence, including, Department of Health and Human Services, Department of Homeland Security.

The unclassified version of HSPD-10 provides a comprehensive framework for the US biodefence programme; to protect America and Americans from any bio-terror attack in post 9/11 security environment. It outlines four essential pillars of overall US biodefence programme, with specific directives, namely:

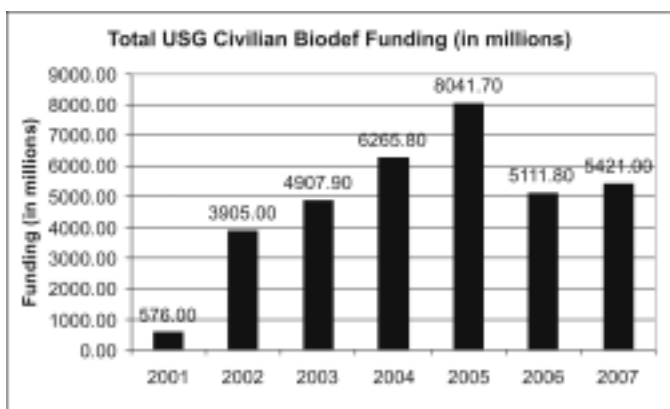
1. Set awareness with BW related intelligence, periodic vulnerability assessments and anticipation of future and emerging threats;

2. Prevention and Protection through interdiction and critical infrastructure protection;
3. Surveillance and Detection, which includes BW attack warning and attribution to ascertain the perpetrator and method of attack;
4. Response and Recovery with response planning, mass casualty care, risk communication, medical countermeasures, and decontamination.

Another major initiative is the BioWatch Programme under the Department of Homeland Security (DHS) for providing early warning of pathogen release with a series of pathogen detectors installed in various US cities along with Environmental Protection Agency (EPA)'s air quality monitors. Though it is not known exactly how many cities are covered under the BioWatch initiative, sources indicate that over 30 cities are presently covered and that it would soon cover another 90 cities. The BioWatch equipment is reportedly installed in the major cities of Philadelphia, New York City, Washington DC and Boston among others. The programme reportedly requested \$118 million in fiscal year 2005 to support and expand BioWatch, including development of improved monitors.

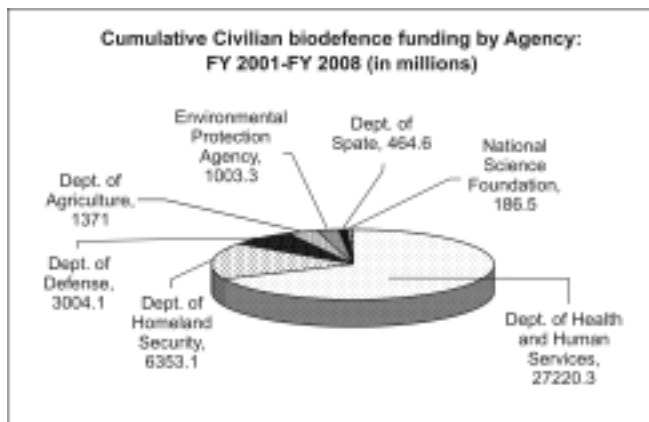
Figure-I

**Total Civilian BioDefence Funding
(in Millions)**



Largely, biodefence funding focuses on research and development, acquisition of medical countermeasures and protective equipment, medical surveillance, preparedness and environmental detection. Though there is no centralised resource for tracking civilian biodefence budgets and spending of over ten federal departments and agencies involved in this mammoth programme, a modest estimate shows that the US government has spent or allocated over \$40 billion since 2001, till the Fiscal Year 2008. The annual bioweapons related spending grew rapidly from Fiscal Year 2001 to Fiscal Year 2005 and reasonably decreased in subsequent years (See, Fig-I). Both, Department of Health and Human Services (DHHS) and Department of Homeland Security (DHS), are primarily responsible for civilian biodefence, and account for over 90 percent of budgeted funds. Among all the departments and agencies, DHHS topped the list of beneficiaries with \$27,220.3 million followed by the DHS with \$6,353.1 millions and Department of Defense (DoD) with 3,004.1 million. The DHHS funding is meant for its major constituent agencies and offices such as Food and Drug Administration (FDA), Health Resources and Services Administration (HRSA) and the Centers for Disease Control (CDC) among others. The CDC BioSurveillance initiative, a project to develop an early-warning system tracking the spread of dangerous biological agents, would receive a boost in Fiscal Year 2008. The other major agencies involved, namely Department of Agriculture, Environmental Protection Agency, Department of State and the National Science Foundation share approximately 3, 025.4 millions in this period (See Fig-II). In the Fiscal Year 2008, the outgoing Bush Administration has proposed an additional \$6.77 billion which is estimated to be \$550 million more than the amount that US Congress appropriated for Fiscal Year 2007.

Figure-II
Cumulative Civilian BioDefence
Funding
FY 2001-FY 2008



These spending and infrastructural overhauling notwithstanding, many aspects of the biodefence programme has been criticized, especially the growing numbers of people involved in handling biological pathogens in sprouting biolabs and facilities around the country. One report stated that there are around 20,000 people working at 400 sites in the US, a ten-fold increase in research since 2001. These figures were given by the Sunshine Project which warned that all these biological defence efforts might produce an incident with greater consequences than an actual act of bioterrorism, either through an accident or by a deranged researcher. It cited cases of institutions carrying out research using live disease agents and the loopholes. Also, the group aired its reservations on the horizontal proliferation of biodefence programmes to other countries. Moreover, some US scientists, disputing the very premises and implementation of the biodefence spending,

think that through this stepped up biodefence efforts, large chunks of government funding diverted from research on ‘pathogens that cause major public health problems (like Diabetes, Cancer and other life threatening most prevalent ailments) to obscure germs (Anthrax, hunta virus, Small pox, etc.) the government fears might be used in a bioterrorist attack’.

Criticism aside, it is reported that the U.S. Centers for Disease Control and Prevention has yet to develop a criteria for judging the success of various biodefence efforts underway in the US. Till now, there is no statistical proof to show that the money allocated for each federal department or agency is well spent and that the measures have been effective as well.

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