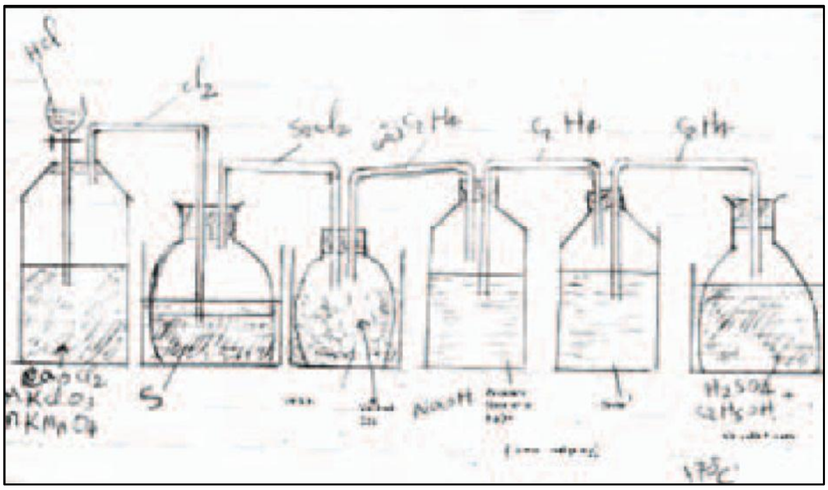

“Assessing the Risk of Proliferation of Chemical and Biological Weapons into **Terrorist Groups**”

Agenda Guide
Committee on Disarmament and International Security
(General Assembly – 1)

Prerna Banga, *Chairperson*
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Foreword

Chemical and Biological Weapons have been used and stockpiled for warfare for more than a millennium. The earliest use of chemical weapons was during the Sumerian civilization and these weapons have only gotten more and more sophisticated and lethal. Chemical weapons like Mustard Gas which were used during the World War II have bad memories in the minds of the victims, and Biological weapons like Anthrax have induced fear in the psyche of the greatest armies in the world. The use of toxins (that are living organisms disseminated through food and water supplies) have led to deaths in numbers like no other conventional weapon ever[1] could making CB warfare, a subunit of CBRN (Chemical, Biological, Radioactive and Nuclear) warfare a stronger colleague of conventional weapons.

"Biological weapons have, in recent history, turned out to have been more stealthy, lethal and indiscriminate in comparison to conventional weapons."

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[1] Botulin Toxin as a Biological Weapons, Consensus Statement; http://www.bt.cdc.gov/agent/botulism/botulismconsensus.pdf (Accessed 30 August 2012)

It is impossible, at the same time, to completely ignore or eliminate the risk of chemical or biological terrorism. Important issues faced by government of the world include the need for increased security with the potential economic costs associated with increased regulation and redirected federal resources, determining the relative ratio between general and specific countermeasures against chemical and biological terrorism, and assessing the success of federal efforts at reducing chemical and biological terrorism vulnerability.

Chemical weapons formulas have been published and publicly available for decades. Mustard agents came of age during World War I, and nerve agents were discovered in the mid-1930s. The production processes used over seventy years ago are still viable. The ingredients and equipment a group would need to produce these agents are readily available because they are also the same items that are used to make various commercial items that we use every day---from ballpoint pens to plastics to ceramics to fireworks. Scientists with a solid chemical background could likely make certain agents in small quantities. This leads us to the major question of Dual Use Technology in the case of production and stockpiling of chemical weapons.[2]

Biological weapons on the other hand are equally capable of mass casualty. One of the classical examples of the use of Biological Weapons for mass casualty was during the Vietnamese war when the US Defense forces used Agent Orange as an Herbicidal spray over Vietnamese agricultural land. Over a period of six years, more than 400,000 people were killed and more than 6000 babies were born with birth deformities.[3]

One of the greatest threats of the existence of Biological and Chemical weapons is not its use by states because in an ever more concerned world, with a considerable number of conventions, treaties and constitutional laws against the use of C/B weapons in warfare, it has become almost apparent that laws of war do not permit the use of them. The concern lies in the use of these weapons by terrorist groups once they're proliferated without a substantial monitoring mechanism. An unfortunate reality is that lot of theorists and scientists believe is that the terrorist groups have found out a way of manufacturing and using these weapons on a small scale at least.

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[2] Chemical and Biological Weapons Nonproliferation Project Information Sheet; http://www.accem.org/pdf/terrorfaq.pdf (Accessed 30 August 2012)

[3] Croft, Steve; Agent Orange, CBS Evening News, May 7, 1980; http://tvnews.vanderbilt.edu/program.pl?ID=270939 (Accessed 30 August 2012)

Birth Deformities found by the use of Agent Orange during the Vietnamese war (1965-71)[4]

Agent Orange used in the Vietnamese war contained dioxin that has affected Major Tu Duc Phang working on duty in Vietnam (1967)[5]

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[4] Image taken from a page by Yoshino Hideo (Chiba prefectural assembly member in Japan) but original image is from Goro Nakamura's book: Vietnam War Agent Orange, p. 119

[5] Cong, Tri; Dioxin - The pain of all people, Vietnam News Agency; http://vietnam.vnanet.vn/Internet/en-US/49/130/4/17/NewsEvents/Default.aspx (Accessed 30 August 201)

Ancient History of Chemical and Biological Weapons (C/B)

Chemical warfare and the use of toxins in warfare have a long history. Textual evidence indicate the use of these weapons in even pre-medieval times, and if we go by loosely derivable facts then chances are that chemical and biological warfare were used even in the battle of *Mahabharata*[6]*.* It is probably the earliest known evidence of the use of Chemical and Biological weapons.

One of the most compelling evidences of the use of the trick of poisoning food and water for war purposes even in 400 BC is derived from the textual evidence of the *Laws of Manu*. These were the laws that prohibited poisoning or the use of toxins in contaminating food and water for the purpose of war. Ancient Hindu texts have referred this act to be *Unethical*. Even though, modern prohibitions and legal restrictions are similar to the treaties of statecraft in the ancient world, it is compelling enough an evidence for us to establish by sense that Chemical or biological warfare is not anything new to this world.

Another striking evidence of the use of chemical and biological weapons in the form of compressed gas is during the Peloponnesian war during 5th BC. It is an ill-informed statement therefore that the use of gas weaponry for warfare is a product of modern science.[7] The battle between Athens and Sparta is a screaming evidence of the use of C/W agents in the ancient times, Spartan forces besieging an Athenian city placed a lighted mixture of wood, pitch, and sulfur under the walls hoping that the noxious smoke would incapacitate the Athenians, so that they would not be able to resist the assault that followed. Hellebore roots were also used for poisoning of the population, most popularly, first used by the Solon of Athens.[8]

English history also recounts tales of the use of chemical and biological weapons during marine warfare. The use of lime, to blind the opposition ship is very widely known. The use of biological warfare is also not lesser documented in the historical texts;

The use of disease as a weapon also exhibited a lack of control aggressors had over their own biological weapons. Primitive

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[6] ed. by M. Bothe ...; Michael Bothe, Natalino Ronzitti, Allan Rosas (1998), The New Chemical Weapons Convention - Implementation and Prospects, Martinus Nijhoff Publishers, p. 17

[7] In Surprise Testimony Cheney Renews Opposition to CWC, United States Senate, 1997-04-08; http://www.fas.org/cw/cwc_archive/cheneyletter_4-8-97.pdf (Accessed 30 August 2012)

[8] David Hume, History of England, Volume II.

medical technology was to be provided with limited means of protection for the aggressor and a battle's surrounding geographical regions. After the battle was won, the inability to contain enemies who escaped death led to widespread epidemics affecting not only the enemy forces, but also surrounding regions' inhabitants. Due to the use of these biological weapons, and the apparent lack of medical advancement necessary to defend surrounding regions from them, widespread epidemics such as the bubonic plague quickly moved across all of Europe, destroying a large portion of its population. The victims of biological terrorism in fact became weapons themselves. This was noted in the middle Ages, but medical advancements had not progressed far enough to prevent the consequences of a weapons use.[9]

Use during World War I and II

In 1907 in Hague, the Hague Convention was probably the only standing legal instrument to prohibit the use of poison or poisonous weapons in the time of war. At the same time, though, more than 124,000 tons of gas were produced by the end of World War I. It was the infamous Poison Gas, and one of the most painful uses of chemical warfare in history. The French were the first to use chemical weapons during the First World War, using tear gas. The Germans' first use of chemical weapons were shells containing xylyl bromide that were fired at the Russians near the town of Bolimów, Poland in January 1915.[10]

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[9] Eitzen, E.; Takafuji, E. (1997), "Historical Overview of Biological Warfare", Military Medicine: Medical Aspects of Chemical and Biological Warfare, Office of the Surgeon General, Department of the Army

[10] Channel 4 Documentary, First World War; http://www.channel4.com/history/microsites/F/firstworldwar/cont_harbinger_3.html (Accessed 2 September 2012)

The first full-scale deployment of chemical warfare agents was during World War I, originating in the Second Battle of Ypres, April 22, 1915, when the Germans attacked French, Canadian and Algerian troops with chlorine gas. Deaths were light, though casualties relatively heavy.[11]

A total 50,965 tons of pulmonary, lachrymatory, and vesicant agents were deployed by both sides of the conflict, including chlorine, phosgene and mustard gas. Official figures declare about 1,176,500 non-fatal casualties and 85,000 fatalities directly caused by chemical warfare agents during the course of the war. To this day unexploded World War I-era chemical ammunition is still uncovered when the ground is dug in former battle or depot areas and continues to pose a threat to the civilian population in Belgium and France and less commonly in other countries. The French and Belgian governments have had to launch special programs for treating discovered ammunition.

Use of Poison Gas during World War I was extensive by the allied governments. As seen in this photograph, it had a direct poisoning effect on the personnel in combat.

As soon as the war ended, most of the unused German chemical warfare agents were dumped into the Baltic Sea, a common disposal method among all the participants in several bodies of

[11] Heller, Charles E. (September 1984), Chemical Warfare in World War I: The American Experience, 1917–1918, US Army Command and General Staff College; http://www-cgsc.army.mil/carl/resources/csi/Heller/HELLER.asp (Accessed 30 August 2012)

water. Over time, the salt water causes the shell casings to corrode, and mustard gas occasionally leaks from these containers and washes onto shore as a wax-like solid resembling ambergris. Even in this solidified form, the agent is active enough to cause severe burns to anybody coming into contact with it.

Dispersion of Poison Gas during World War I [12]

In 1920, the Arab and Kurdish people of Mesopotamia revolted against the British occupation, which cost the British dearly. As the Mesopotamian resistance gained strength, the British resorted to increasingly repressive measures. Much speculation was made about aerial bombardment of major cities with gas in Mesopotamia, with Winston Churchill, then-Secretary of State at the British War Office, arguing in favor of it.[13]

In 1925, sixteen of the world's major nations signed the Geneva Protocol, thereby pledging never to use gas in warfare again. Notably, in the United States, the Protocol languished in the Senate until 1975, when it was finally ratified.[14]

In 1961 and 1962 the Kennedy administration authorized the use of chemicals to destroy vegetation and food crops in South Vietnam. Between 1961 and 1967 the US Air Force sprayed 12 million US gallons of concentrated herbicides, mainly Agent Orange (containing dioxin as an impurity in the manufacturing process) over 6 million acres (24,000 km) of foliage and trees,

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[12] New Photographic History of the World's War (New York, 1918)
[13] Anatomy of a War by Gabriel Kolko, ISBN 1-56584-218-9 pages 144-145
[14] Philip Huang (October 17, 2002), "Sickening strategy", Oregon Daily Emerald; http://www.dailyemerald.com/2.2378/sickening-strategy-1.222877 (Accessed 4 September 2012)

affecting an estimated 13% of South Vietnam's land. In 1965, 42% of all herbicides were sprayed over food crops. Besides destroying vegetation used as cover by the NLF and destroying food crops the herbicide was used to drive civilians into RVN-controlled areas.

In 1997, an article published by the Wall Street Journal reported that up to half a million children were born with dioxin related deformities, and that the birth defects in North Vietnam were fourfold those in the South. The use of Agent Orange may have been contrary to international rules of war at the time. It is also of note that the most likely victims of such an assault would be small children. A 1967 study by the Agronomy Section of the Japanese Science Council concluded that 3.8 million acres (15,000 km) of land had been destroyed, killing 1000 peasants and 13,000 livestock.[15]

Modern Day Stockpiling

Middle East[16]

Egypt:	First country in the Middle East to obtain chemical weapons training, indoctrination, and material. It employed phosgene and mustard agent against Yemeni Royalist forces in the mid-1960s, and some reports claim that it also used an organophosphate nerve agent.
Israel:	Developed its own offensive weapons program. The 1990 DIA study reports that Israel maintains a chemical warfare testing facility. Newspaper reports suggest the facility be in the Negev desert.
Syria:	It began developing chemical weapons in the 1970s. It received chemical weapons from Egypt in the 1970s, and indigenous production began in the 1980s. It allegedly has two means of delivery: a 500-kilogram aerial bomb, and chemical warheads for Scud-B missiles. Two chemical munitions storage depots, at Khna Abu Shamat and Furqlus. Centre D'Etude et Recherche Scientifique, near Damascus, was the primary research facility. It is building a new chemical-weapons factory near the city of Aleppo.

[15] Thai Troops clashes in Vietnam, 1971; http://news.google.com/newspapers?nid=1338&dat=19810102&id=KaYSAAAAIBAJ&sjid=SfkDAAAAIBAJ&pg=5267,706410 (Accessed 29 August 2012)
[16] "Chemical Weapons in the Middle East", Arms Control Today, October 1992, pp. 44-45.

Iran:	Initiated a chemical and warfare program in response to Iraq's use of mustard gas against Iranian troops. At end of war military had been able to field mustard and phosgene. Had artillery shells and bombs filled with chemical agents. Was developing ballistic missiles. Has a chemical-agent warhead for their surface-to-surface missiles.[17]
Iraq:	Used chemical weapons repeatedly during the Iraq-Iran war. Later it attacked Kurdish villagers in northern Iraq with mustard and nerve gas. Since end of Gulf War UN destroyed more than 480,0000 liters of Iraq's chemical agents and 1.8 million liters of precursor chemicals.
Libya:	Obtained its first chemical agents from Iran, using them against Chad in 1987. Opened its own production facility in Rabta in 1988. May have produced as much as 100 tons of blister and nerve agents before a fire broke out in 1990. Is building a second facility in an underground location at Tarhunah.
Saudi Arabia:	May have limited chemical warfare capability in part because it acquired 50 CSS-2 ballistic missiles from China. These highly inaccurate missiles are thought to be suitable only for delivering chemical agents.

Asia

North Korea:	Program since 1960s, probably largest in the region. Can produce "large quantities" of blister, blood, and nerve agents.
South Korea:	Has the chemical infrastructure and technical capability to produce chemical agents, had a chemical weapons program.
India:	Had CW stocks and weapons.
Pakistan:	Has artillery projectiles and rockets that can be made chemical-capable.
China:	China has a mature chemical warfare capability, including ballistic missiles.
Taiwan:	Had an "aggressive high-priority program to develop both offensive and defensive capabilities", was developing chemical weapons capability, and in 1989, it may be operational.

[17] "Technologies Underlying Weapons of Mass Destruction",
US Congress, Office of Technology Assessment, OTA-ISC-559 (Washington, D.C.: US Printing Office, August 1993), pg. 73.

Burma:	Its program, under development in 1983, may or may not be active today. It has chemical weapons and artillery for delivering chemical agents.
Vietnam:	In 1988 was in the process of deploying, or already had, chemical weapons. Also it captured large stocks of US riot control agents during and at the end of the Vietnam War.

Europe

Yugoslavia:	The former Yugoslavia has a CW production capability. Produced and weaponized Sarin, sulphur mustard, BZ (a psychochemical incapacitant), and irritants CS and CN. The Bosnians produced crude chemical weapons during the 1992-1995 war.
Romania:	Has research and production facilities and chemical weapons stockpiles and storage facilities. Has large chemical warfare program, and had developed a cheaper method for synthesizing Sarin.[18]
Czechoslovakia:	Pilot-plant chemical capabilities that probably included Sarin, Soman, and possibly VX.
France:	Has stockpile of chemical weapons, including aerosol bombs.
Bulgaria:	Has stockpile of chemical munitions of Soviet origin.

USA:	Has the second largest arsenal of chemical weapons in the world, consisting of ~31,000 tons of chemicals, and 3.6 million grenades. The chemical weapons contain about 12,000 tons of agents, and 19,000 tons are in bulk storage. Details on composition and location are given in Table 1.[19]
Russia:	An estimate of the Russian stockpile in 1993 puts it at ~40,000 agent tons, of which one-fourth is of pre-World War II vintage. A larger portion seems to be in bulk storage. Out of the officially declared quantity 30,000 tons are phosphoric organic agents

[18] SIPRI Yearbook 1993, World Armaments and Disarmament, Oxford University Press, 1993, pp. 277-281.

[19] Andrew M. Sessler. John M. Cornwall, Bob Dietz, Steve Fetter, Sherman Frankel, Richard L. Garwin, Kurt Gottfried, Lisbeth Gronlund, George N. Lewis, Theodore A. Postol, David C. Wright, "Countermeasures: A Technical Evaluation of the Operational Effectiveness of the Planned US National Missile Defense System", Union of Concerned Scientists, MIT Security Studies Program, April 2000.

	(Sarin, Soman, VX), the remaining 10,000 tons are composed of 7,000 tons lewisite (in containers ?), 1,500 tons of mixture of mustard gas and Lewisite (GB, GD, VX), and 1,500 tons mustard gas.

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C/B Terrorism: Fundamentals

Chemical and Biological Weapons acquisition by terrorist groups is not a distant reality, at the same time it is not entirely improbable. With the stealth and effectiveness involved in making chemical and biological weapons, terrorist proclivity to use Chemical and Biological weapons had only increased.

Terrorist killings in Tokyo's subways was by clever and extensive use of Chemical Weapons.

It is a widespread belief now that terrorist interest in Chemical and Biological weapons is own increasing, in part as a result of publicized new evidence of terrorist interest and capabilities, as well as the political fall-out from the war in Iraq.[20] This is a serious present concern that deserves examination in the broader framework provided by the patterns, motivations and historical

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[20] CRS Report for Congress, Small-scale Terrorist Attacks Using Chemical and Biological Agents An Assessment Framework and Preliminary Comparisons; file:///C:/Users/Siddharth/Desktop/SYMMUN-Research/Main.pdf (Accessed 4 September 2012)

context for the current terrorist threat. Although it can have a powerful psychological impact, past CBW use by terrorists has been rare and has not caused a large number of casualties, especially compared to other weapons. Terrorist attacks are deliberately designed to surprise, so no trend analysis will ever perfectly predict them, especially in the contemporary international climate.

While there is considerable information about state acquisition and/or use of CBW, evidence regarding non-state acquisition and/or use is contradictory and often sketchy. Although hard evidence is limited, a sampling of terrorist groups or individuals that are reported to have shown an interest in or used chemo-bio agents (usually in very limited ways) includes the PKK (Kurdistan Worker's Party), believed to have weaponized the nerve gas sarin; HAMAS (Islamic Resistance Movement), which has reportedly coated shrapnel with poisons and pesticides; numerous U.S. domestic individuals and groups without foreign connections (including the Minnesota Patriots Council, the so-called "Alphabet Bomber," R.I.S.E., Larry Wayne Harris, and others) who have used or intended to use ricin, plague, anthrax, hydrogen cyanide, sarin, and other agents; and of course Al Qaeda and its associated groups. But the efforts of Aum Shinrikyo represented a watershed, with its bizarre and seemingly irrational agenda, its systematic pursuit of technical competency, and its repeated attempts to kill a large number of Japanese civilians. Even with its multiple technical failures, Aum Shinrikyo led to heightened anxiety about the attractiveness and feasibility of future mass casualty terrorist use of CBW.

Assessing the Probability of a C/B Attack [21]

Chemical weapons formulas have been published and publicly available for decades. Mustard agents came of age during World War I, and nerve agents were discovered in the mid-1930s. The production processes used over seventy years ago are still viable. The ingredients and equipment a group would need to produce these agents are readily available because they are also the same items that are used to make various commercial items that we use every day---from ballpoint pens to plastics to ceramics to fireworks. Scientists with a solid chemical background could likely make certain agents in small quantities. However, two factors stand in the way of manufacturing chemical agents for the purpose of mass casualty.

[21] The Henry Simpson Center, Frequently Asked Questions: Likelihood of Terrorists Acquiring and Using Chemical or Biological Weapons; http://www.accem.org/pdf/terrorfaq.pdf (Accessed 5 September 2012)

First, the chemical reactions involved with the production of agents are dangerous: precursor chemicals can be volatile and corrosive, and minor misjudgments or mistakes in processing could easily result in the deaths of would-be weaponeers. Second, this danger grows when the amount of agent that would be needed to successfully mount a mass casualty attack is considered. Attempting to make sufficient quantities would require either a large, well-financed operation that would increase the likelihood of discovery or, alternatively, a long, drawn-out process of making small amounts incrementally. These small quantities would then need to be stored safely in a manner that would not weaken the agent's toxicity before being released. It would take 18 years for a basement-sized operation to produce the more than two tons of sarin gas that the Pentagon estimates would be necessary to kill 10,000 people, assuming the sarin was manufactured correctly at its top lethality.

The probability of a WMD attack by terrorists, particularly by the use of Chemical and Biological weapons is also largely dependent on the motivations that terrorist groups have in the favor of this use.

Terrorists Motivations for a C/B Attack[22]

In the famous book *Toxic Terror*, nine different case studies was elaborated upon for the motivations that terrorist groups may have for the use of Chemical and Biological weapons for mass casualty. Following are the briefs of these cases derived from a CRS Report.[23]

- Tendency to employ ever-greater levels of violence over time.
- Innovation in designing weapons and carrying out attacks.
- Willingness to take risks by experimenting with unfamiliar and dangerous weapons.
- Psychological factors of paranoia and grandiosity (most significant with respect to individual terrorists who act alone or with support of a few followers).
- A system of internal social controls that severely punishes deviation or defection, and an organizational structure that resists penetration by police or intelligence agencies.

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[22] The Henry Simpson Center, Frequently Asked Questions: Likelihood of Terrorists Acquiring and Using Chemical or Biological Weapons; http://www.accem.org/pdf/terrorfaq.pdf (Accessed 5 September 2012)
[23] Terrorist Group Proclivity toward the Acquisition and Use of Weapons of Mass Destruction: A Review of the Terrorism Studies Literature; M. Karen Walker

- Planning and operations involving either a small group of two to five people or a militant subgroup within a larger organization who are technically skilled and subscribe to the groupís goals and ideology.
- A vague, undefined constituency, which Tucker considers a decisive factor in judging which terrorist groups are most likely to attempt the acquisition and use of chemical and biological agents.
- Defensive aggression against outsiders seeking the groupís destruction, and an apocalyptic ideology translated into myriad goals such as destroying a corrupt social structure, fighting an oppressive government, and punishing evil-doers and oppressors, in fulfillment of a divine command or prophecy from a charismatic leader.[24]

It is almost probable that terrorists could now acquire chemical and biological weapons to carry out small scale attacks, however large scale attack that poses global threat is rather improbable.

There is also a growing concern about the increasing availability of information and resources for the building of weapons by subnational groups that in former years had been feasible only with the resources of a state. Like the rest of the world, terrorist groups have access to the vast amount of technical data disseminated through the Internet. More and more information that might previously have been difficult to collect is becoming

[24] Terrorist Group Proclivity towards WMD; http://www.rhetoricalens.info/images/terrorist_group_proclivity_toward_wmd.pdf (Accessed 5 September 2012)

easily accessible. Among the groups that have reportedly demonstrated interest in acquiring unconventional weapons (besides Al Qaeda) are the PLO, the Red Army Faction, Hezbollah, the Kurdistan Workers' Party, German neo-Nazis, and the Chechens.

At the same time, the breakup of the Soviet Union increased potential access to a vast, highly advanced arsenal of not only nuclear but also chemical and biological weapons and expertise. The combination of greater movement of people, knowledge and products across borders in a globalized world, and greater availability of materials and expertise in the post-Soviet era, have together led to a potentially serious erosion in state control over chemical and biological weapons (or their ingredients).

Terrorism and C/B Weapons

Terrorism and C/B Weapons is a very lethal combination and given the ease and weapons productivity of this kind of warfare, it is only a feared thought that terrorists will soon start executive terrorism by the use of toxins and chemicals. Three pillars in the use of C/B Weapons in terrorist purposes comprises of acquisition, dispersal and manufacture. And the unfortunate reality is that all three of them are certain probabilities.

Acquisition by Terrorist Groups

Oftentimes, obtaining biological agents is portrayed as being as easy as taking a trip to the country. The experience of the Japanese cult Aum Shinrikyo proves that this is not the case. Isolating a particularly virulent strain in nature---out of, for example, the roughly 675 strains of *botulin toxin* that have been identified---is no easy task. Despite having skilled scientists among its members, Aum was unable to do so. Terrorists could also approach one of the five hundred culture collections worldwide, some of which carry lethal strains. Within the United States, however, much tighter controls have been placed on the shipment of dangerous pathogens from these collections in recent years.[25]

In contrast, some analysts point out that the changing nature of terrorist organizations may lower the barriers for those groups

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[25] For an extensive overview of the use of chemical, biological, and toxin agents by non-state actors see: *Ron Purver, Chemical and Biological Terrorism: The Threat According to the Open Literature, Canadian Security Intelligence Service, 1995*. A comprehensive compilation of biological agent use and its context can be found in W. Seth Carus, Bioterrorism and Biocrimes: The Illicit Use of Biological Agents Since 1900, op. cit

who wish to use chemical or biological agents. Historically, terrorist groups tended to possess clear, defined political aims and easily identified constituents. These groups' activities were constrained by the cultural and moral beliefs of their constituents, including the general aversion to the use of chemical or biological agents.[26] Additionally, the potential for disease transmission from an infected terrorist target to a terrorist supporter was viewed as a barrier to biological terrorism. Recently, terrorist groups bearing a fundamentalist, extremist view lacking clear political goals and having a diffuse, less easily identified constituency have become more common. Many analysts suspect that the taboo against use of C/B agents has weakened, since these groups may be less susceptible to traditional deterrents and may be less concerned with maintaining a high level of legitimacy to their constituents. Changes in political makeup of these groups also may result in a reassessment of the terrorists' choice between conventional and unconventional arms.[27]

Manufacture by Terrorist Groups

Experts disagree on the difficulty of C/B agent manufacture. Many experts believe that it is relatively easy to manufacture some chemical agents, while others point to the apparent difficulties that state actors have had in developing chemical weapons programs. Some experts claim that development of weaponized biological agent presents remarkably high hurdles, particularly in mass dissemination, which would require teams of scientists with state backing to overcome.

Manufacture of Chemical and Biological weapons at the hands of terrorists would be rather different from the manufacture of chemical and biological weapons. In the figure below, a typical estimation of manufacture of chemical and biological weapons by terrorists is pitched against the same manufacturing process by governments or state protocols.

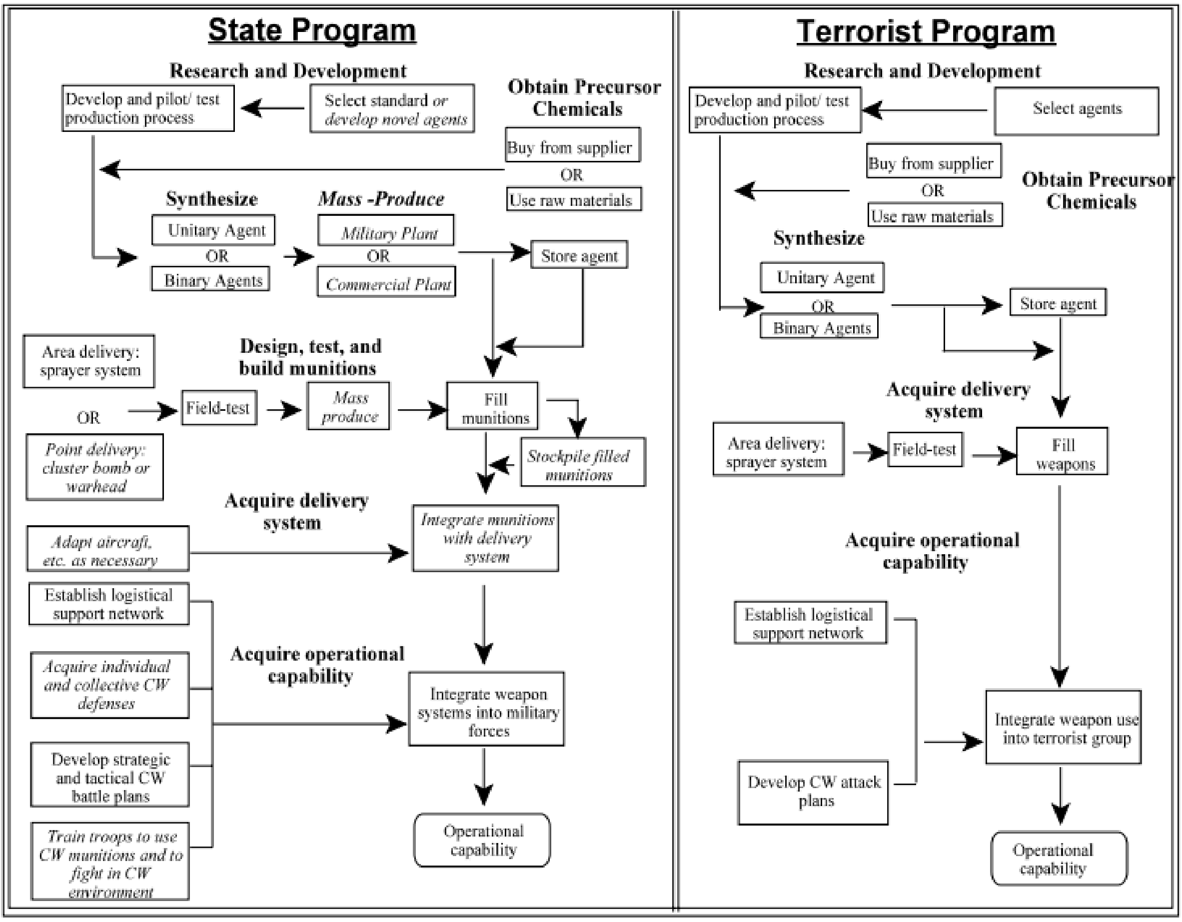
Most chemical agents require artificial synthesis and manufacture, so a prospective terrorist would be concerned with their relative ease of production. While dual-use chemical agents are potentially available by theft or purchase in large quantity, many chemical agents require a dedicated synthetic effort to acquire in bulk. In some cases, precursor chemicals required to

[26] Central Intelligence Agency, Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional, Munitions, 1 January Through 30 June 2003, November 2003.

[27] CRS Report from Congress; An Assesment Framework for Preliminary Comparisons; Small-scale Terrorist Attacks Using Chemical and Biological Agents.

synthesize agents can be purchased on a research scale without undue difficulty. The technology necessary to manufacture most chemical agents is known through the open literature.[28]

Figure 1. Comparison of State Chemical WMD and Terrorist Chemical Agent Development



The safety and efficiency of chemical synthesis and manufacturing practices have increased substantially since the early manufacture of chemical agents. While the equipment necessary for large-scale manufacture of these agents is regulated through export controls, equipment necessary to create small-scale amounts of chemical agents at home, in makeshift laboratory facilities, can be purchased through many chemical distributors. Attempting to manufacture chemical agents under such circumstances comes with increased risk of discovery and inadvertent exposure to the agent.

[28] Central Intelligence Agency, Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional, Munitions, 1 January Through 30 June 2003, November 2003.

Ease of Dissemination of C/B Weapons

Chemical agents are typically dispersed as a gas or liquid, depending on the ambient temperature and the agent. Gases dilute themselves into the surrounding atmosphere, limiting their effectiveness. In most cases, chemical agent effects arise from some form of interaction with the vapors or the aerosols of these agents. Liquids that are not volatile do not provide enough vapor for inhalation and must either be aerosolized or heated to maintain their effect.

Unlike chemical agents though, biological agents can reproduce and are generally grown suspended in liquid solutions. They are more difficult than chemical agents to effectively disseminate in the air. They may be disseminated via other media (see below). Some biological agents can be dried and ground into small particles which can be released as aerosols, but this is a fairly advanced technique. Because of the natural filtering capacity of the human airways, there is an optimal range of particle size that will deeply penetrate the lungs. Many experts cite the difficulty of preparing or disseminating biological agents in such a particle size range as a primary barrier to terrorist use. Other experts counter that commercial dissemination equipment, namely technologies similar to yard foggers and crop dusters, can be adapted to provide aerosols that, while not optimal in size, will still be infectious. Additionally, not all biological agents must be lodged deep in the lungs to cause infection.

Some biological agents are contagious from person to person. Each person infected with a biological agent which is contagious by casual contact can become a new dissemination vector. These highly contagious agents might be viewed by terrorists as more useful than other types of biological agents, as people not in the original exposed area may fall ill through such contact. All other factors being equal, contagious agents that require close contact may be viewed by a terrorist as less useful than those needing only casual contact, due to the lower probability of secondary infection.[29]

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[29] Ken Alibek, a former high ranking official in the Soviet weapons program and a widely quoted expert on biological weapons, claims that many scientists who worked for the former Soviet Union's biological weapons program have been approached by groups interested in purchasing their expertise. See, for example, Ken Alibek, Biohazard: The Chilling True Story of the Largest Covert Biological Weapons Program in the World — Told from Inside by the Man Who Ran It, op. cit. pp. 271-272.

A Note from the Executive Board

Discussing on an agenda as advanced and cultured as assessment of the risk or threat of terrorist use and acquisition of Chemical and Biological weapons has a lot of technical prerequisites. One of them is the knowledge and understanding of the detailed mechanism of the ways and production of these weapons, and understanding if it could be scaled down by terrorists and used by them for the purposes of small-scale attacks.

With this session of the DISEC, we intend to resolve on certain strict policy guidelines and safety measures from all of you to ensure that Tokyo Subway killings or any other related terrorist incident does not happen again. Terrorism is tempting with its tremendous possibilities. The principles of terrorism are only speaking the language of rebound of injury and rebellion. The acquisition of C/B agents could very well be a reality one day, and the threat of these agents is far more frightening to me than the threat of a nuclear war.

Nuclear war is a deterring term, nothing else. Chemical and Biological warfare may lead to another Vietnam, another Iraq, but it would be even more uncontrollable and merciless if Al-Qaida is carrying it out.

We hope that among the dignified presence of representatives from Arms Control Association, Arms Division of Human Rights Watch and Centre for European Security and Disarmament, this session of the DISEC leads to a fruitful resolution.

Siddharth Soni
Vice Chairperson, DISEC

On behalf of:
Prerna Banga
Chairperson, DISEC

Notes