

# CBW

# Magazine

Journal on Chemical and Biological Weapons

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Micro-organisms - BTWC Concerns

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Recent evidence from multiple outbreak sites demonstrates that the H1N1 pandemic virus has established itself rapidly and is now the dominant influenza strain in most parts of the world. The World Health Organisation (WHO) estimated that the pandemic will persist in the coming months as the virus continues to move through susceptible populations. Moreover, studies have detected no signs that the virus has mutated to a more virulent or lethal form. The last issue of the magazine had dealt with this pandemic. However this issue appears to be far from over.

The current issue of the magazine looks at the national implementation measures for the use of micro-organisms with respect to the concerns raised by the Biological and Toxin Weapons Convention (BTWC). This has been dealt in great depth by Dr. B M Gandhi.

Alok Mukhopadhyay in his article highlights the EU's approach towards chemical, biological, radiological and nuclear (CBRN) security and Peter Garretson puts forward his viewpoint on counter bio-terrorism.

This issue also features other regular sections like country profile, kaleidoscope, chemical and biological news and book review.

With our reader's feedback, we wish to publish issues in the future that focus on a subject of particular concern.

Contributions and feedbacks are welcome and can be addressed to: **editorcbw@gmail.com**.

## Overview of National Implementation Measures for Use of Micro- organisms - BTWC Concerns

Dr. B M Gandhi

*The author was Advisor, Department of Biotechnology, Ministry of Science and Technology and is currently the Chief Executive Officer, Neo Biomed Services.*

### Summary

The bio-medical scientists are restrained to maintain voluntary code to ensure that activities involving microbial or other biological agents, or toxins whatever their origin or method of production, are only of types and in quantities that have justification for prophylactic, protective or other peaceful purposes. A legal network of Rules and Acts by the Government of India provides guidelines to the researchers and the policy makers to enforce prohibitions against biological weapons and govern the transfer of select agents.

It is well recognized that modern technologies have dual use applications both for peaceful purposes as well as hostile use. Modern biology and bio-technology offer novel ways of manipulating basic life processes. Purposefully or unintentionally, genetic modification of microorganisms could be used to create organisms that are more virulent, are antibiotic-resistant, or have greater stability in the environment. In such conditions the scientists shoulder ethical responsibilities in wider applications of such technologies keeping in view the potential risks and concerns of misuse and in compliance with the requirements of international conventions and treaties relevant to their research work.

The managers and the agencies involved in funding, conducting, administering and regulating biomedical sciences research and development share ethical and social responsibility to assure that use of knowledge and skill for the advancement of human welfare is conducted in a way that the use of microorganisms, toxins or other biological agents is not for hostile purposes.

The use in armed conflicts of biological weapons, as well as of chemical weapons, was prohibited by the Geneva Protocol in 1925. The Biological and Toxin Weapons Convention (BTWC) of 1972, which entered into force in 1976, is comprehensive and prohibits the development, production, stockpiling, transfer or acquisition of biological agents and equipment for hostile purposes. Under the Convention the design, construction or possession, for any purpose, of delivery mechanisms designed to use biological agents or toxins for hostile purposes or in armed conflict is prohibited. More than 160 States have already ratified or acceded to it.

The States Parties to the BTWC have undertaken to facilitate and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes including prevention of diseases without hampering the economic or the technological development of State Parties.

International efforts to regulate the potential environmental damage of man made microorganisms have centered on agreement, reached at the Earth Summit in Rio de Janeiro in 1992, on a set of principles intended to achieve sustainable development while protecting the environment. These principles include: increasing the availability of food, feed and renewable raw materials improving human health; enhancing the protection of the environment' establishing enabling mechanisms for the development and environmentally sound application of biotechnology; and enhancing safety and developing international mechanisms for cooperation. This principle explicitly requires further development of internationally agreed principles on risk assessment and management of all aspects of biotechnology.

Under the circumstances, the bio-medical scientists are restrained to maintain voluntary code to ensure that activities involving microbial or other biological agents, or toxins whatever their origin or method of production, are only of types and in quantities that have justification for prophylactic, protective or other peaceful purposes. A legal network of Rules and Acts by the Government of India provides guidelines to the researchers and the policy makers to enforce prohibitions against biological weapons and govern the transfer of select agents.

## Guiding Principles

Several international agencies and professional bodies have drafted ethical codes of conduct for scientists engaged in life sciences. In order to prevent the use of bio-medical sciences for purposes of bio-terrorism or bio-warfare, all persons and institutions engaged in all aspects of bio-medical sciences need to abide by ethical code of conduct. Some of the guiding principles applicable to use of microorganisms for research and development are:

**Principles of non-maleficance**, whereby it is ensured that the discoveries of biomedical research scientists and knowledge generated are not likely to facilitate, bio-terrorism or bio-warfare.

**Principles of beneficence**, whereby it is ensured that legitimate benefits would outweigh the risks and harms.

**Principles of institutional arrangements**, whereby reasonable care is taken to ensure that all procedures are complied and all institutional arrangements assure bio-security. Access of biological agents is allowed to bonafide scientists in a transparent manner who, there are reasonable grounds to believe, will not misuse them.

**Principles of risk minimization**, whereby due care and caution is taken to restrict the dissemination of dual use information and knowledge in cases where there are reasonable grounds to believe that there are serious risks that information or knowledge could be readily misused to inflict serious harm through bio-terrorism or bio-warfare.

**Principle of ethical review**, whereby research activities are subjected to ethics and safety reviews and monitoring to establish their ethical acceptability.

**Principles of transmission of ethical values**, whereby the duties and obligations embodied in the code are transmitted faithfully to all who are, or may become, engaged in the conduct of biomedical research.

**Principles of voluntariness**, whereby researchers are fully apprised of the research and the impact and risk of such research but retain the right to abstain from further participation in research that they consider ethically or morally objectionable.

**Principles of compliance**, whereby scientists abide by laws and regulations that apply to the conduct of scientists, duties and obligations embodied in this code, and disseminate the same to all concerned.

## Code of Conduct for Bio-Medical Scientists

In 1982, the World Health Organisation (WHO) and the Council for International

Organisations of Medical Sciences (CIOMS) issued the 'Proposed International Guidelines for Biomedical Research involving Human Subjects.' Subsequently the CIOMS brought out the 'International Guidelines for Ethical Review in Epidemiological studies' in 1991 and 'International Ethical Guidelines for Biomedical Research involving Human subjects' in 1993.

In India, the Indian Council of Medical Research released a 'Policy Statement on Ethical Considerations involved in Research on Human Subjects'. In February 1980 for the benefit of all those involved in clinical research in India. Ethical Guidelines for Biomedical Research on Human Subjects were released by ICMR in 2000 setting up code of conduct for scientists engaged in biomedical research.

## **Ethical Guidelines for Genetic Research**

Genetic research involving humans has already provided benefits to humankind in the form of drugs, vaccines, diagnostics and other knowledge for better management of health and disease. New vistas for molecular medicine have opened for human welfare especially in the areas of improved diagnosis of diseases, early detection of genetic predisposition to diseases, rational drug design, new drug targets and pharmacogenomics etc. At the same time it is also raising questions of social consequences such as privacy, confidentiality and individual rights to access personal records. There are potential risks in collection of information or principles.

The Ethical Policies on the Human Genome, Genetic Research and Services, 2002 drafted by the Department of Biotechnology of the Government of India provides guidance to the researchers, ethical committees, institutions, organisations and the public on the conduct of research based on recognized ethical principles and values. Issues related to Integrity, Respect and Beneficence; Justice; Consent; Dissemination of Research Results; Gene Therapy and Human Cloning; Genetic Testing and counseling, Genetic Privacy and Discrimination; Intellectual property Rights

and Benefit Sharing; DNA and Cell-line Banking; and International Collaboration have been addressed. Even though these guidelines relates to the ethical policies for genetic engineering research and services per se, any such research need to obtain approvals of the competent authorities, including ethical clearances of the institutions, animal and human concerns, biosafety issues etc., which in turn provides guidance and also directly exerts a control over the conduct of the life science experiments.

Due regard must be shown to these principles, embodies in the Convention, in drafting any code of conduct or practice so that it is not misused to restrict or deny access to bio-technologies and to hamper exchange of knowledge and research works amongst the scientists both nationally as well as internationally.

## **Indian Legal Network**

The Government of India, keeping in view potential risks to human and to environment, enacted regulatory mechanism for import, export, use, and research on microorganisms including genetically modified organisms. These are guidelines for the researchers involved with research and developments related to microorganisms and toxins and their genetic modifications, if any and have direct relevance to the provisions of BTWC. Some of the Legislations and Rules by the Government of India of direct relevance to BTWC include:

**The Indian Environment (Protection) Act, No. 29 of 1986** dated May 23, 1986 was enacted for protection and improvement of environment and prevention of hazards to human beings, other living creatures, plants and property. Subject to provisions of this act, the government has the powers to take all such measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating environmental protection, including laying down procedures and safeguards for the handling of hazardous substances and carrying out and sponsoring investigations and research relating to problems of environmental pollution.

With a view to protecting the environment, nature and health, in connection with the application of gene technology and micro-organisms, the Central Government, Ministry of Environment & Forests enacted the **Rules for the Manufacture, Use/ Import/ Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or Cells through notification of December 5, 1989**. These rules are applicable to the manufacture, import, export and storage of micro-organisms and gene-technological products; genetically engineered organisms/micro-organisms and cells and correspondingly to any substance and products and food stuff etc. of which such cells, organisms or tissues hereof form part; new gene technologies and organisms/ micro-organisms and cells generated by the utilization of such or other gene-technologies and to substances and products of which such organism and cell form part.

Competent authorities have been identified, which ensures implementation of the provisions of the Act. **Recombinant DNA Advisory Committee (RDAC)** recommends suitable and appropriate safety regulations for India in recombinant research, use and applications from time to time. **Institute Bio-safety Committee (IBSC)** is mandatory to be constituted by an occupier including research institutions / university / industry handling microorganism / genetically engineered organisms. IBSC prepares an up-to-date site emergency plan according to the manuals/guidelines of the Review Committee on Genetic Manipulation (RCGM). This committee also looks into the biosafety aspects including experimentation and containment issues. **Over 350** such committees are already functional in various research institutions / universities / industries handling microorganism / genetically engineered organisms. **Review Committee on Genetic Manipulation** based in the Department of Biotechnology monitors the safety related aspects in respect of on-going research projects involving genetically engineered organisms/hazardous microorganisms. The Committee also brings out Manuals of guidelines specifying procedure for regulatory process with respect

to activities involving high-risk category and controlled field experiments and reviews to ensure that adequate precautions and containment conditions are followed as per the guidelines. **Genetic Engineering Approval Committee (GEAC)** under the Ministry of Environment, Forest and Wildlife approves activities involving large-scale use of hazardous microorganisms and recombinants in research and industrial production related to release of genetically engineered organisms and products into the environment including experimental field trials.

Department of Biotechnology formulated **Recombinant DNA Guidelines in 1990**, which were further revised in 1994 and again in 1998 addressed issues related to large-scale production and deliberate release of GMOs, plants, animals and products into the environment, shipment and importation of GMOs for laboratory research. It also deals with genetic transformation of green plants, rDNA technology in vaccine development and on large-scale production and deliberate/accidental release of organisms, plants, animals and products derived by rDNA technology into the environment. Research under the guidelines has been classified into categories based on the level of the associated risk and requirement for the approval of competent authority. The guideline gives principles of occupational safety and hygiene for large-scale practice and containment, safety criteria and physical containment conditions depending on the type of organisms handled and potential risks involved and various quality control methods needed to establish the safety, purity and efficacy of rDNA products.

**Revised guidelines for research in transgenic plants & guidelines for toxicity and allergenicity evaluation of transgenic seeds, plants and plant parts**, were enacted by the Department of Biotechnology in 1998 to include complete design of a contained green house for transgenic plants. Besides, it provides the basis for generating food safety information on transgenic plants and plant parts.

A set of **Guidelines were developed on**

safety, purity, potency and effectiveness of the project. **By the Department of Biotechnology for generating pre-clinical and clinical data for rDNA vaccines, diagnostics and other biological, 1999** to help in the production of relevant data for submission to Drug Controller General of India.

Notification of the **Task Force on Recombinant Pharma (2006)** suggested a regulatory mechanism and process related to use of living Modified Organisms (LMOs) in the pharmaceutical industry during the various stages of R&D, testing, manufacture, import and marketing of LMOs as drugs/Pharmaceuticals. These recommendations shall be applicable in respect of recombinant Pharma products under Rules for the Manufacture, Use, Import, And Export and Storage of Hazardous Micro Organisms Genetically Engineered Organisms or Cells, 1989' of EPA, 1986.

**National Seeds Policy, 2002** ensures that all genetically engineered crops/varieties are tested for environment and bio-safety before their commercial release as per the regulations on guidelines of the EPA, 1986.

**Drug Policy, 2002** has reference to the recombinant DNA products where Clause 12.1 of the policy states that bulk drugs produced by the use of rDNA technology, bulk drugs requiring in vivo use of nucleic acid as the active principles and specific cell/tissue targeted formulations require an industrial license for production.

**The Weapons of Mass Destruction and their Delivery Systems (Prohibitions of Unlawful Activities) Act 2005** ensures punishment under the act for any act of omission contrary to the provisions thereof, of which the person is guilty in India. The act applies to unlawful exports, transfer; re-transfer, transit and trans-shipment, directly and indirectly, of any one biological and chemical weapon by any state or non-state actor, of materials, equipment and technology of any description relating to weapons of Mass Destruction or their means of delivery.

**The Foreign Trade (Development and Regulation) Act, 1992 No. 22 of 1992 dated August 7, 1992 and Export Control on Dual Use Technologies.**

Our industry is a user of special materials, equipment and dual-use technologies and products. Fully aware of the potential misuse of the uncontrolled proliferation of these technologies and products of direct and indirect application to Weapons of Mass Destruction (WMD) and their means of delivery, India has been exercising a degree of control over the export of these Special Chemicals, Organisms, Materials, Equipment and Technologies (SCOMET) items. Export of these SCOMET items requires a license which is regulated under notification No. 5 (RE-2000)/1997-2002, New Delhi, dated March 31, 2000 issued by the Director General of Foreign Trade, Ministry of Commerce, Government of India known as The Foreign Trade (Development and Regulation) Act, 1992 No. 22 of 1992 dated August 7, 1992 commonly known as FTDR Act. Category 2 of the Appendix III of the notification includes list of microorganisms/toxins including bacteria, fungi, parasites, viruses, rickettsias, plant pathogens and genetically modified organisms, which require license and export of these items, are also controlled by other applicable guidelines issued from time to time.

Export or attempt to export in violation of any of the conditions of license to export shall, *inter alia*, and without prejudice to prosecution under any other Act for the time being in force, invite criminal prosecution under the Customs Act, 1962.

Export of SCOMET items is permitted only against a license / permission, in accordance with the Policy contained in Appendix 3 to Schedule 2 of ITC (HS). It is not permitted under an advance license or any other license issued (under a duty exemption or remission scheme) by the DGFT. For obtaining a license or permission for a SCOMET item, the exporter has to apply in the Aayaat Niryaat Form to the Directorate-General of Foreign Trade to be considered by Inter Ministerial Working Group (IMWG) under the Chairmanship of the Export Commissioner and consisting of



representatives of concerned agencies in the Government of India, which include Ministry of External Affairs, Ministry of Defense, Central Board of Excise & Customs, and concerned Ministries/Departments (e.g. Departments of Atomic Energy/Space/DRDO/ Department of Chemicals and Petro-chemicals/ Department of Bio-technology), as required, for technical advice.

Import of biomaterials is free as mentioned in **Schedule-1 of ITC (HS) classification of Export-Import items 2004-2009**.i.e these materials do not require any import license. However, the import duty is paid which is near about 22% for microbiological samples. The permission of regulatory bodies like GEAC, RCGM and DCG(I) {For Substances Mentioned in D&C Act} is necessary for imports.

## **Transfer of Biological Material**

India's current system of controls over exports of special materials, equipments and technologies was instituted in 1995 on the basis of recommendations made by a Small Group set up in Department of Science & Technology in 1993. Transfer of biological material through joint collaborative international projects or industrial ventures related to work with these exotic biological agents and toxins require close scrutiny. The Ministry of Health & F.W. vide Office Memorandum No.L.20025/90-90-F. dated February 27, 1992 permitted the restricted transfer of biological material abroad under certain circumstances for research/ diagnostic purposes. Guidelines for **Exchange of Human Biological Material for Biomedical Research** purposes were issued by the Ministry of Health & F.W vide F. No. L.19015/53/97-IH (Pt.) dated November 19, 1997. Human Material with potential for use in biomedical research included Organs and parts of organs; Cells and tissue; Sub-cellular structures and cell products: Blood; Gametes (sperm and Ova); Embryos and Fetal Tissue; Wastes (urine, feces, sweat, hair, epithelial scales, nail clippings, placenta etc.); Cell lines from human tissues etc.

Dual use items and technologies have potential

to be used as weapons in addition to their commercial applications and have growing threat of terrorism to society. Realizing the threat various groups/arrangements were made to track the exports of these dual use materials / agents in various countries. **Australia Group** is one such group. This group formed in 1985 has 41 countries and European commission as its participants. The Australia Group is an informal forum of countries which, through the harmonisation of export controls, seeks to ensure that exports do not contribute to the development of chemical or biological weapons. All states participating in the Australia Group are parties to the Biological Weapons Convention (BWC), and strongly support efforts under those Conventions to rid the world of CBW. India is not a member of this group.

## **Information Dissemination**

In order to identify potential users of the dual-purpose new technologies, baseline information and distribution of disease pattern may be essential. In this regard awareness programmes about the possible threats against biological weapons may give special emphasis to information on various types of biological weapons and the availability of systems to detect and analyze the nature of biological weapons, source of availability of drugs and vaccines, and the laboratory facilities to deal with certain attacks. A strong working relationship between research institutions, scientists and health professionals would improve the capacity to both detect and respond to bio-terror attack. Laboratory diagnostic procedures in common use as improved biotechnologies would help in early response. Emergency distribution and treatment of antibiotics and vaccines would be useful for emergency interventions for naturally occurring epidemics. Policies related to threat perceptions and role of stake holders would need to be examined and additional efforts would be required for development of vaccines and diagnostics for the potential bio-war agents.

Baseline information is required on Indian biotech industries and pharmaceutical industries dealing with production of vaccines/

diagnostics/other products using exotic micro-organisms known to have potential of use as biological weapons. Collaborative programmes involving participation of foreigners' transfer of biological agents and toxins material would require close scrutiny.

Every country is proposed to take necessary action with regard to developing strategies for bio-security against biological weapons without hampering legitimate research and free flow of information in the field of biotechnology. A system of checks and balances needs to be developed to assure that the growing power of the life sciences is only used to protect life and not to destroy it. The following issues require attention of the policy makers as well as researchers;

- There must be an increased awareness of the risk of bio-terrorism among scientists and scientific leaders. In order to augment awareness about the security issues, arrangements would need to be made for training and accreditation of programmes that would increase considerable awareness and stimulate better communications between scientific and national securities communities.
- Bio-security policies must take a bottom up approach by including direct involvement of working scientists. Any such strategy that blocks the publication of certain research materials would impede carriers of scientists in the fields of biotechnology and discourage new incumbents to enter into research in biotechnology. Guidelines would need to be developed to allow the researchers to publish their work without providing information that would be useful to bio-terrorists.
- Universities and other scientific institutions should develop procedures to monitor scientific activities and design fool proof action plan to prevent any strategic information leakage in relation to bio-technology to bio-terrorists who would in return adversely utilize this

information for creating bioterrorist activities.

- The whole issue of bio-security would need to be looked into from the view point of bio-safety, bio-security and information dissemination and if need to be necessary SOPs may be prepared.
- Guidelines may be prepared for dissemination of information with regard to publication of sensitive information on the dual use technologies.
- A policy of outreach to industry must be adopted and industry should be fully informed and involved with the process of national polices consideration.

## **To Conclude**

Fully recognizing that modern technologies and related equipment have dual use applications both for peaceful as well as hostile purposes, the scientists shoulder ethical responsibilities in wider applications of such equipment and technologies in compliance with the requirements of international conventions and treaties relevant to their research work. The researchers, managers and the agencies involved in funding, conducting, administering and regulating biomedical sciences share ethical and social responsibility to ensure use of modern knowledge on micro-organisms, toxins or other biological agents for the advancement of human welfare. Government of India is taking all necessary steps to ward against bio-terrorism activities. Various legislations have been enacted to protect the environment of pollutants and any other subversive activity because of the biological agents. However, to ensure bio-safety and bio-security, awareness programmes with active participation of the researchers in the implementation arms of legislations would need to be further strengthened.

## European Union Policy on CBRN security: A Primer

Alok Rashmi Mukhopadhyay

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### Summary

The attempt has been to provide a brief primer by using the basic documents prepared and adopted by various EU institutions as well as the national governments to present the EU endeavour to address the Chemical, Biological Radiological and Nuclear (CBRN) threat. As the Counter-Terrorism strategy and the CBRN threat therein is still the exclusive realm of a member state, the EU, with all its complex nature of working and the evolution of its dynamic nature of institutions, however strives for a coordinated EU action in a crisis situation. Therefore the CBRN policy package of 110 million Euros with 132 measures is a concrete and timely step towards the protection of EU citizens.

The European Commission (EC) adopted on June 24 a policy package on chemical, biological, radiological and nuclear (CBRN) security. With the sole aim to strengthen the protection of European Union (EU) citizens, the package envisages to have the EU Action Plan to counter CBRN threats.<sup>1</sup> During the second half of 2009, i.e. under the Swedish presidency of the EU Council, the member countries of the Union would discuss the plan. Eventually the implementation would start in 2010 and be followed over the next three years. Quite understandably in its Work Programme during the incumbent EU presidency, Sweden has already highlighted that in order to ‘prevent and manage major CBRN incidents’, the Swedish effort would be to increase the EU capability and to strengthen cooperation.<sup>2</sup> The effort of EU to formulate its CBRN policy emerges out from the national experiences of its member states and their respective counter-terrorism strategies discussed below.

Countering CBRNE (chemical, biological, radiological, nuclear and explosives) terrorism lies at the heart of the British Counter-Terrorism strategy. Britain, which was holding the EU presidency in the second-half of 2005 and still was coming to terms with the ghastly terrorist attacks on the London underground of July 7, was one of the key architects to formulate the European Union Counter-Terrorism strategy of November 2005. The July 7 terrorist attacks in London, which still remain a watershed in the global history of modern-day terrorism, did undoubtedly influence to a great extent the British policy-makers to adopt protective measures as well as to give their national experience a pan-European scope. While the British Counter-Terrorism Strategy of 2003 – also known as CONTEST - is based on four pillars namely Pursue, Prevent, Protect and Prepare, the EU Counter-Terrorism Strategy also has the same pillar-based approach i.e. Prevent, Protect, Pursue and Respond.<sup>3</sup> The EU certainly is not a nation-state and time and again the relevant EU documents have been highlighting that the responsibility of counter-terrorism is mainly of its member countries. However the foremost observation one could make here is that the national experiences and

threat perceptions of the member states have been seriously taken into account in Brussels and transformed into EU-wide policies.

The second pillar of the EU Counter-Terrorism Strategy, i.e. Protect, deals with the issue of CBRN and highlights the importance of cooperation with international organisations and partners and offering technical assistance to third countries. In addition to that it stresses the need to stop the proliferation of CBRN materials. Following the all-embracing pillar-based EU Counter-Terrorism Strategy, the action plan in the CBRN policy package has three wide areas of action: (i) prevention; (ii) detection; (iii) preparedness and response. At the national level, again referring the British experience, the UK in its Security, Counter-Terrorism Science and Innovation Strategy of 2007 has given greater emphasis to the threat from CBRN materials. Justifiably protecting the populace from any eventualities of CBRN attacks, the British Innovation Strategy prescribed that various government agencies and ministries ranging from the Cabinet Office to intelligence agencies and departments like transport, home, environment, health etc. would work in close cooperation while the British Ministry of Defence is supposed to be the assistance-provider to the civilian authorities. Even the CONTEST-II of March 2009 underscores the severity of CBRN threat to the UK in great detail. The CONTEST-II, which is an updated version of CONTEST of 2003 and is an attempt to summarise the British and global counter-terrorism experiences in the last six years and adopt appropriate measures, is an exhaustive and comprehensive document. Interestingly the CONTEST-II devotes an entire section to the issue of CBRN. Three main issues, which in the intervening time have increased the risk of CBRN materials used by the terrorists, are: (i) trafficking of material, which can be used for the purpose of making radiological weapons; (ii) information available on the Internet to build CBRN devices and (iii) the dual-use nature of CBRN materials which can be procured by terrorist organisations. The CONTEST-II has also not overlooked the risk of state-sponsored proliferation of CBRN material like in the case of A Q Khan.<sup>4</sup>

Following the four pillars of the CONTEST, the pursuit of CBRN material lies primarily

with the British security and intelligence agencies. Prevention of such attacks is not only the responsibility of the government but the communities and the scholars who can intellectually challenge the narrative of Al-Qaeda as well. A number of national and multilateral legal instruments aiming primarily to deny terrorists the access to CBRN materials are also covered under the pillar of prevention. Finally the prepare part of the strategy gives greater underscoring to research, development and training of police and civilian officers. In nutshell the particular attention on the CBRN threat in the British CONTEST-II is the outcome of the fact of the July 7 attacks, the foiled attacks in August 2006 against transatlantic airlines, including numerous others in Britain and the specific instance of death of the Russian dissident Alexander Litvinenko by polonium poisoning radiation in London. Last but not the least pressing concern is having Heathrow as one of the busiest transport hub in the world. Hence the British focus is more on the futuristic element of the CBRN threat and to deny the existing terrorist networks on its soil to acquire any material and devices. Another important member of the Union, France, during its presidency in the second-half of 2008 organised an experts' seminar on the CBRN threat participated by its members states. In this seminar the French government proposed to create a European database to reinforce cooperation amongst the member states and improve the information available to the field officers. Gilles de Kerchove, the European Counter-Terrorism Coordinator and other delegates approved the project. Apart from the major EU member states, it must be worth mentioning here that the NATO- the collective security provider of most of the EU members - has also raised its first Multinational CBRN Defence Battalion in 2003. Endorsed in the Prague Capability Commitment, the NATO CBRN Defence Battalion is equipped to undertake five specific tasks: (i) reconnaissance; (ii) identification; (iii) detection and monitoring; (iv) assessments and advice; (v) decontamination.<sup>5</sup>

It is needless to reiterate here that the EU certainly does not have all the tools at hand in comparison with the national governments

and their various organs and facilities, yet the awareness of the grave nature of the CBRN threat and simultaneously the earnestness to deal with the problem at the European level has been evident. The unique nature of the Union facilitates borderless travel not only for its citizens, goods and tourists. But most dangerously this freedom is also exploited by the terrorists to travel freely to the most part of the continent. The rationale of a common European approach is based on the present situation where the expeditious abolition of old national borders is also the cause of an escalating vulnerability, as the CBRN policy package puts it: 'The European Union is an area of increasing openness and an area in which the internal and external aspects of security are closely linked. It is an area of increasing interdependence, allowing the free movement of people, ideas, technology and resources. As a result it is also an area which terrorists may abuse to pursue their objectives and which has already been abused for this purpose.' In fact this justification in the CBRN policy package echoes the spirit of the first-ever European Security Strategy of December 2003.<sup>6</sup> In its preamble the European Security Strategy was neither erroneous nor pompous in declaring that, 'Europe has never been so prosperous, so secure nor so free' but at the same time also categorised five key threats especially: Terrorism, Proliferation of WMD, Regional Conflicts, State Failure and Organised Crime. The 'serious possibility' of attacks with CBRN materials was mentioned in the category of Proliferation of WMD. However in order to be chronologically accurate it must be mentioned here that even before the adoption of the European Security Strategy, the EU Council in its Framework Decision of June 13, 2002 on combating terrorism declared that, 'manufacture, possession, acquisition, transport, supply or use of weapons, explosives or of nuclear, biological or chemical weapons, as well as research into, and development of, biological and chemical weapons' will be considered as terrorist offences.

In the last five years since the adoption of the European Security Strategy the key threats for Europe has not at all decreased. On the contrary terrorism has preceded the other key threats. The terrorist attacks of March 11, 2004 in

Madrid, killing of the controversial Dutch film maker Theo van Gogh on November 2, 2004 on a street of Amsterdam, the London attacks and a few foiled and numerous unearthed terrorist plots throughout the continent have distinctively characterised the security situation of Europe today. The prime cause of the terrorist attacks, i.e. the quick, silent and violent radicalisation of a part of the younger diasporic Muslim communities in Europe, still remains a part of the larger debate. However, which makes the European security agencies jittery that the increasing threat of acquiring CBRN materials by terrorist groups remains an obvious risk. Keeping in view of the developments of the last five years, the Report on the Implementation of the European Security Strategy of December 2008 has highlighted the need to tighten the coordination amongst the member states in the case of a major terrorist CBRN attack. Though the Implementation Report is not a total revision of the European Security Strategy of 2003, but it is a review of the changing nature of global threats. Hence it has redrawn the key threats to provide 'security in a changing world'. Though independent observers of the Union may be of the opinion that terrorism has remained the key threat for the EU during the last five years, the Implementation Report has however emphasised that the Proliferation of WMD as 'potentially the greatest threat to EU security' which has increased in the said period. Compared with the original European Security Strategy of 2003 the Implementation Report has clubbed Terrorism and Organised Crime together and identified other new threats like cyber security, energy security and climate change.<sup>7</sup>

The entire depiction of European endeavour against the CBRN threat would however remain incomplete if the practical danger of CBRN attacks or even reported attempts should not be mentioned here. For last few years it is the annual exercise of the European Police Office (Europol) to collect all kind of terrorist-related data from all member states and publish it in the form of EU Terrorism Situation & Trend Report (TE-SAT) for wider dissemination. The TE-SAT Report of 2008 has documented two specific instances. The Danish High Court in December 2007 convicted three persons, who allegedly gathered information about the

manufacturing of bombs and explosives from Internet over and also procured fertiliser and chemicals, in order to make peroxide based primary bombs. In July 2007 Italian counter-terrorism agency arrested three persons who had been accused to impart terrorist training at a mosque in Perugia province of Italy. The Italian police also recovered barrels of chemicals and terrorist instruction material after a search. The terrorist cell unearthed was linked with the Moroccan Islamic Combat Group (GICM) linked with the March 11, 2004 attacks in Madrid.<sup>8</sup> The TE-SAT Report of 2009 does not have any mention of any CBRN related incidents for the year of 2008, but it has to be highlighted that the UK, one of the EU majors, has not provided any date to the Europol.

The attempt here has been to provide a brief primer by using the basic documents prepared and adopted by various EU institutions as well as the national governments to present the EU endeavour to address the CBRN threat. As the Counter-Terrorism strategy and the CBRN threat therein is still the exclusive realm of a member state, the EU, with all its complex nature of workings and the evolution of its dynamic nature of institutions, however strives for a coordinated EU action in a crisis situation. Therefore the CBRN policy package of 110 million Euros with 132 concrete measures is a concrete and timely step towards the protection of EU citizens. No policy, whatever good it looks on paper, is however successful, if it is not tested in a crisis situation. In the context of a crisis situation observers of EU affairs may recall during the Mumbai attacks, EU member states joined forces, in which the Swedish participation was noteworthy, to evacuate injured EU citizens from India.<sup>9</sup> As the EU consists of some of the most industrialised, provided societies with advance technology, India, as one of its strategic partners, may specifically include the issue of CBRN threat under the rubric of EU-India counter-terrorism cooperation when the next annual summit in November would take place in Delhi with the current Swedish presidency.

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## Counter Bio-Terror

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### Summary

There is much more to a whole of government response to a bio-terror attack than the public health system. For adequate government performance in such an emergency, and to directly counter terrorist goals of instilling panic and undermining the government, many additional capabilities must be exercised. Because a bio-terror response involves so many different agencies, it is also a rich forum for bilateral cooperation, as it multiplies the strategic touch-points between nations and leads to more robust and timely communication and response with good cross-domain learning.

Modern Nation States are complex systems that today suffer from the affliction of terrorism, which can attack its vital centers and connective tissue. Even as nation's try to counter, terrorists are themselves evolving and seeking new capabilities to more effectively injure their hosts, including all forms of weapons of mass destruction (WMD).

While there is a general worrisome trend of proliferation of WMD-related skills and tools, nowhere are the barriers to entry coming down faster than in the field of biological weapons. The worldwide boom in biotechnology has proliferated biotechnology expertise world wide, while world wide web, and flattening of the world means the same pool of information, talent, and capital is also available to those who oppose the existing order.

Whereas once the full resources of a nation-state were required for a bio-weapons program, this is no longer the case. Although ultimately unsuccessful in weaponization, as far back as a decade ago, Aum Shinrikyo<sup>1</sup>, a sub-national group showed it had both the intent and capability to procure such capabilities and expertise. Since then, the precursors, data, expertise, equipment, and finances are all much more available.

For a long time, policy makers have taken comfort in the knowledge that dangerous pathogens were kept under lock and key in controlled facilities. But this is no longer the case.

With the advent of on-line catalogs of gene sequences, the proliferation of low-cost, portable gene sequencers, mail-order sequences, and the rapid advances in synthetic biology, researchers have proven that they can manufacture pathogens "ex-nihili." This creates the worrisome possibility in the not too distant future of genetic "hackers" creating designer pathogens in a computer and then hitting "print" to their local gene sequencer. As with 9-11, we are confronted with the capability of malcontents to use our own tools against us.

Countering such capabilities and low signature activities will be difficult. Countering them

in liberal, pluralist democracies like India and the US will be doubly challenging, as we value the diversity of thought and discourse and are hesitant to suppress dissent or heavily indoctrinate our citizenry into a single view of “the good.”

But we must not fail to evolve our own immune systems, and one thing states can do is band together to ensure dissemination of best practices and ability to lend mutual support.

As a necessary consequence with violent intent have greater freedom to speak, spread, connect, travel and operate. We cannot suppress. Instead, we must evolve and adapt our immune systems.

The core of any response to bio-terrorism is excellence in one’s Public Health System. Only the ability to contain and respond to an outbreak of a disease can limit its damage.

Proactive development of a responsive Public Health System is necessary, but not sufficient. There is an urgent need to address the Non-Public Health aspects of Counter-BioTerrorism (C-BT), but these are not well understood.

In general, the Non-Public Health aspects of Counter Bio Terror include state policies and actions that might prevent a bio-terror attack, state posture to deny the benefits and attractiveness of an attack, actions to be taken by non-public health agencies in coping with and responding to an attack, attribution forensics, and potential state responses to the perpetrators of an attack.

## **Prevention**

There are a number of policies and actions states can take that can help prevent an attack from ever occurring. First is active construction of Arms Control regimes that dissuade states from undertaking bio weaponization programs that directly proliferate offensive knowledge, and tools that might fall into terrorist hands. Second is the construction of international criminal norms and cooperative mechanisms for handling non-state actors engaged in bio-terror schemes and actions. This might include the shaping of existing bodies such as

the role of the International Criminal Court, or constructing new bodies, such as an INTERPOL for Asia. Third is the development of norms relating to States taking legitimate self defense against sub-national actors within their own borders and against actors in another’s sovereign territory when they are not able or willing. Fourth is putting in place cooperate agreements that aid in bio-forensics where the expertise may lie outside of public health agencies. And finally, selective intelligence sharing agreements that facilitate prevention, attribution, and response.

## **Posture**

A second non-public health aspect of C-BT is a state posture to deny the benefits and attractiveness of an attack. The first action states can take to deter action is to have explicitly stated response policies that give both terrorists and would be state sponsors pause. States should decide in advance how they wish to counter, whether it be with ambiguity or clear red lines that if crossed, would engender a very serious response. A second aspect involves making the freedom of maneuver of the terrorists in society more difficult, but creating public awareness about what constitutes suspicious activity and to whom to report it. The final and most important aspect is defence by denial, meaning that the posture of the state is such that an attack will not have its intended impact. A terrorist attack is usually demonstrative act intended to communicate some message to a particular audience, either to force some capitulation based upon a power of blackmail/threat, or weaken and erode the existing order by demonstrating its weakness in order to ultimately replace it with something else, or by provoking an over-reaction by the government or some partisan group which further undermines societal bonds for the same end. In either case, the terrorist looks to make the state look inept and helpless, and to make itself look powerful, and uncounterable. To that end, it seeks to maximize the psychological impact by maximizing damage and casualties and the ineptitude of the state in prompt response, and the presence of both in the media reaching its chosen audience. Here the state can deny such benefits by having a well orchestrated



and exercised inter-agency response with strong strategic communications capability. This involves such matters as civil defence plans, stocks of agent response medicines, and having conducted detailed response exercises involving all relevant departments and agencies based on multiple scenarios to iron out interagency responsibilities and communication bottlenecks.

## Coping

Another aspect that must be considered is the actions taken by non-public health agencies in coping with and responding to a bio-attack. A bio-terror attack will be different from a more ordinary disease outbreak in that it will require coordination, and command and control of non-public health responder teams, including special capabilities resident in law enforcement, intelligence, military units. States must consider the necessary strength, training, and equipment of such teams for such functions as surveillance, response, and decontamination, as well as how they interact with one another and who has lead authority and jurisdiction in which phase, and where they should reside in the overall command and control concept.

A second aspect of coping involves the creation and maintenance of national level tools for consequence modeling, decision-making, graphic outputs for public communication and inter-agency collaboration, command & control. There is a need to ensure that key decision-makers have access to high quality tools that allow them to make the best possible decisions and inputs to the public response infrastructure in the minimum amount of time. Such tools would be grounded in an overall Geographic Information System with population densities, location of critical infrastructure, traffic flow and congregation patterns, that can accept meteorology, model plume distribution, epidemiological models, infection/contagion response curves, and analytic tools to make evacuation and quarantine decisions.

## Attribution

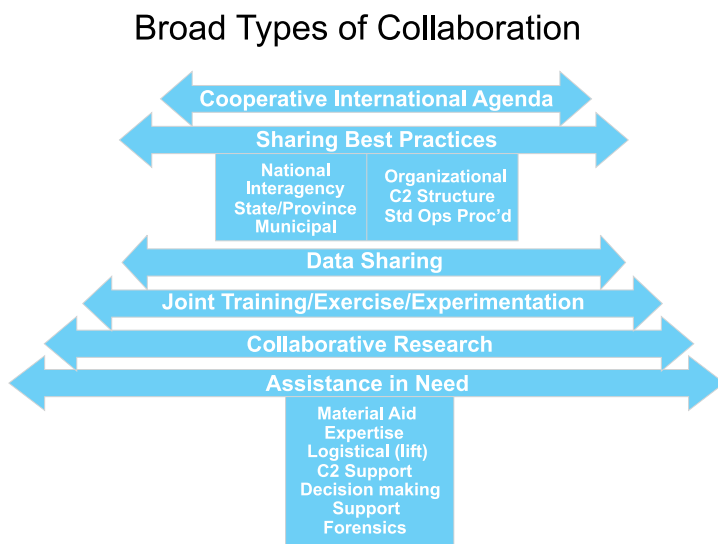
Another aspect of a whole-of-government

counter-bioterror effort likely to involve capabilities outside the public health structure is attribution forensics. There is a need for policies and procedures that address the role of intelligence, law enforcement, and military research and bio-weapons experts and related labs in the effort in post-attack forensics and attributions. There is a need to specify at what point authority shifts from first responders to forensics, and how intelligence, law enforcement, and military capabilities cooperate and share information, including the leveraging of other nation's intelligence, law enforcement, and military expertise and non-overlapping knowledge.

## Response

Another area which differentiates a natural disease from a bioterror attack is the state response against the state actors or non-state actors and their sponsors after attribution. This may or may not require a declarative policy. For a state actor, it might require clarity (at least internally) as to whether or not it would generate a conventional response, sub-conventional response, and in-kind response, a nuclear response, and degree of desired ambiguity. Whether or not a stated policy exists, it is useful to run through scenario planning to have thought through what is and is not actionable, and at what would be the triggers (of kind, of severity) for such action.

## Collaboration



India and the United States, with large populations and population densities, high amounts of international traffic, and open democratic systems share concerns about their permeability to terrorist attacks. Counter-Bio Terror is an attractive area for meaningful Indo-US bilateral security collaboration.

Some might balk at the magnitude of the problem of coordinating so many different agencies, particularly given the extremely limited cross-bureaucracy dialogue and bandwidth below the most senior levels, but seen in this light, “it is not a bug, it is a feature.” As discussed above, any response to counter-bioterror would be tremendously interdisciplinary and inter-agency, fraught with interesting and difficult command, control, and cooperation problems, which require a wide number of contacts involved, both at the C2 and technical expertise levels, at central, state, and local levels. By thinking through together counter-bioterror scenarios, significant mutual learning is likely to take place, including sharing of best practices.

The organisational learning from such a rich scenario is likely to result in significant cross-domain learning, and useful transfer to other counter-terrorism efforts, including other Weapons of Mass Destruction (WMD), such as nuclear or chemical, and other Weapons of Mass Effect (WME), such as cyber attacks, and natural or man-made accidental catastrophes (Earthquake, Tsunami, Typhoon, Nuclear or Chemical accident).

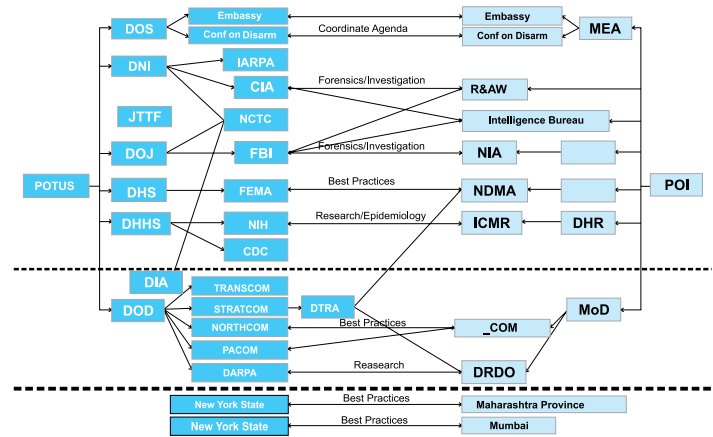
## Paths To Cooperation

If counter-bioterror is a rich topic for bilateral cooperation, what might it look like? There are two general categories, both of which allow for reduced time lag and increased effectiveness in preventing and coping. The first deals with proactive measures, and the second with reactive measures.

### Proactive Collaboration

Typically there is some parallel or equivalent organisation in each country that needs to be talking about non-sensitive matters below the

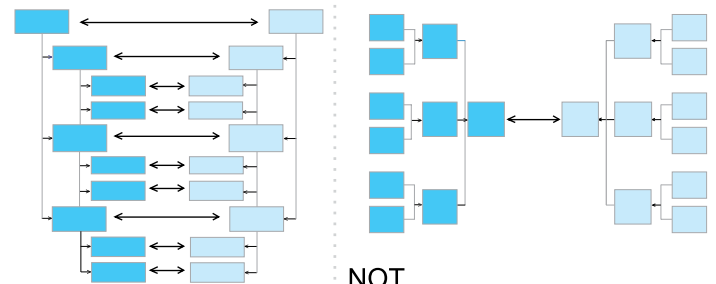
### Organisational Avenues of Collaboration



Joint Secretary level, to be aware of each other’s capabilities and challenges.

Such organisational touch-points typically relate to those serving some command and control function (who is tasked, how, what procedures are followed, who takes decisions), and those with expertise particular to the function they serve (forensic expertise, investigative expertise, etc.).

### Multiply Bandwidth



- Information Age Collaboration
  - High Bandwidth
  - Fault tolerant & Robust
- Industrial Age Collaboration
  - Low Bandwidth
  - Bottlenecked

By proliferating the contacts between domain expertise and command & control structures the number of possible data-flows increases, reducing the chance of a “strategic bottleneck,” and allowing for rapid response reactions and high bandwidth information flow in an actual emergency. In all cases, it is useful to understand each other’s best practices and consider internal reform as well as consideration for the actual limitations of the other side. In some cases, data sharing agreements between like organisations can speed detection, characterization, forensics, and response. In other cases, there may be

opportunities to do collaborative research, such as work on new means of detection, characterization, and agent countering, or decision-making tools. And in some cases, as with first responders, joint training, exercises, and experimentation are very useful in closing the seams between organisations that are not used to working together and understanding the previewing of problems likely to arise in interaction, so as to find work around. Another useful area for collaboration is in compatibility between decision support software suites to allow sharing of data, models, and remote reach-back support.

A final area for collaboration is setting a cooperative international agenda to set norms, counter the potential use, and make bio-weapons proliferation more difficult.

## **Reactive Collaboration**

This category generally refers to becoming familiar with material assistance the other country is capable of providing in an hour of need. Such assistance might include material aid (medicines, decontamination gear, tents, blankets, water, etc.), expertise (medical, investigative, forensic), and specialized packaged capabilities, such as logistical support, air and sea lift, decontamination teams, counter-terrorism units, deployable forensic experts, remote sensing / biosensor kits, and command, control and communications (C3) capabilities. Typically such requests for assistance are worked through the respective embassies, but receiving organisations must understand in advance what are the menu of options they can request in order to even think about requesting them. Likewise, it is useful for them to have some familiarity with the organisation providing the assistance, and the realistic capabilities and timeframes from request to deployment. Sometime there are established alternate channels (such as Air Force, Navy, Army, and theater combatant command dialogues), which could be used to good effect.

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## An Assessment of Iran's Chemical and Biological Weapons

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### Summary

Western intelligence agencies believe that Iran developed chemical and biological weapons during the Iran-Iraq war (1980-88) and has probably preserved these capabilities till today. Iran has never appropriately confirmed its holdings of chemical and the status of its biological weapons programs. The 2005 Noncompliance Report judges from available information that Iran's nasty programme appears to be maturing, with a swiftly evolving capacity for the delivery of nuclear, chemical, and biological weapons in a variety of ways. However, one thing is clear that allegations regarding Iran's chemical and biological weapons (CBW) are mostly based on intelligence and cannot be assessed by independent analysts.

The scope and status of Iran's chemical and biological weapons programmes are still unclear. Iran agreed to the Geneva Protocol in 1929 and joined the Biological and Toxin Weapons Convention (BTWC) in 1973 and the Chemical Weapons Convention (CWC) in 1997. Western intelligence agencies consider that Iran developed chemical and biological weapons during the Iran-Iraq war (1980-88) and has possibly conserved these capabilities even today.

### Chemical Weapons

Iran's chemical weapons (CW) program was launched during the Iran-Iraq War in response to use of Iraqi CW against Iran. Iran suffered severe losses from the use of Iraqi chemical weapons. As a result, Iran has had a great deal of experience in the effects of chemical warfare. Iran is party to the Geneva Protocol, which excludes the use of CW. CW engages utilising the toxic properties of chemical substances as weapons to kill, injure, or incapacitate an enemy. Chemical weapons are different from employing conventional weapons because the destructive consequences of CW are not mainly due to their explosive force.

CW is categorized as weapons of mass destruction by the United Nations, and their production and stockpiling was prohibited by the Chemical Weapons Convention (CWC) of 1993. Iran has been an active participant in the work of the Organisation for the Prohibition of Chemical Weapons (OPCW). The Convention gave for the possibility of a one-time extension of the final chemical weapons destruction deadline up to 5 years, to 2012. On endorsement the CWC, Iran opened its facilities to international inspection and claimed that all offensive CW activities had been suspended and the facilities smashed prior to the treaty's entering into force.

The United States (US) has constantly accused that Iran maintained an active programme for the expansion and production of CW. The programme contained production of important quantities of sarin, mustard, phosgene, and

hydrogen cyanide. Reports of transactions of various dual-use materials are publicly known. Imports such as thiodyglycol and thionyl chloride can be applied towards legitimate reasons such as dyes, textiles, and pesticides or can be diverted towards an illicit CW program. Iran also brought several tons of phosphorus pentasulfide, which is on the Australia Group's watch list for controlled chemical forerunners, but not on the CWCSchedule lists. The compound has several genuine uses in the agricultural industry, specially linking to pesticides, but is also an initial point for nerve agents such as VX. Based on such information, some plan of Iran's CW status can be determined. However, open-sources did not provide strong support to the US allegations. As of 2008, US government accuses Iran of having a huge and rising commercial chemical industry that could be used to support a chemical agent mobilization capability. On February 5, 2008, McConnell, Director of National Intelligence said that "we know that Iran had a chemical warfare program prior to 1997, when it declared elements of its program. We assess that Iran maintains dual-use facilities intended to produce CW agent in times of need and conducts research that may have offensive applications. We assess Iran maintains a capability to weaponize CW agents in a variety of delivery systems."<sup>1</sup>

Recently, Jane's Defence Weekly reported that an explosion occurred in Syria and dozens of Iranian engineers and 15 Syrian officers were killed, when the joint Syrian-Iranian team was attempting to accumulate a chemical warhead on a Scud missile. From the explosive site lethal chemical agents, including sarin nerve gas were found.<sup>2</sup>

It was assumed that Iran manufactured weapons for blister, blood, and choking agents. It was also believed to be performing research on nerve agents. Its manufacture capacity was projected at 1000 tons a year, with major manufacture facilities situated at Damghan, 300 km east of Tehran. Other facilities were believed to be located at Parchin, Qazvin, Abu Musa Island, Engineering Research Center for the Construction Crusade (Jihad-e Sazandegi), Isfahan, Karaj, and Marvdasht, Melli Agrochemicals (National Agrochemicals).

Iran is dedicated to the growth of its civilian and military industries to engage an ongoing process of modernization and development of the chemical industry aimed at minimizing dependence on foreign countries for the materials and technology. China, as well as Russia are important suppliers of technologies and equipment for Iran's chemical weapons program.<sup>3</sup>

However, Iran always denied producing or possessing chemical weapons in violation of CWC obligations. On January 23, 2008, Iranian chief nuclear negotiator, Saeed Jalil stated that "I assure you that the (chemical) weapons have no place in our defense doctrine."<sup>4</sup>

## Biological Weapons

There is very limited information available to determine whether Iran is pursuing a biological weapons program. Western sources believe that Iran first developed its Biological Weapons (BW) in 1980s, and it continues to pursue a nasty biological program associated to its civilian biotechnology activities. The US charges that Iran may have begun to develop small quantities of agents, possibly including mycotoxins, ricin, and the smallpox virus. In 1996 report to the US Senate, the Central Intelligence Agency (CIA) claimed that "Iran has had a biological warfare program since the early 1980s."<sup>5</sup> Currently, Iran's growing biotechnology industry does have the potential to divert dual-use agents for illicit warfare purposes.

Iran has revealed an interest in obtaining BW agents from foreign sources. Canadian and Netherlands scientists were contacted by Iranian personnel appearing to acquire mycotoxin-producing fungi (*Fusarium spp.*) in 1989. Several dual-use items have been imported into Iran from Western countries. In early 1980s, with the approval of the World Federation of Culture Collections, the Iranian Research Organisation for Science and Biotechnology set up a 600-strain Persian Type Culture Collection to support Iran's biotechnology industry. Here it must be noted that Bruno Schiefer, the Canadian toxicologist contacted by Iran, was doubtful Iran would use the strains for illicit

BW purposes. He speculated that the Iranians were most likely trying to acquire the fungi for defensive purposes, like developing gas masks that would be protective in the event of its offensive use.

The most common agents that are connected with the Iranian BW program in the open text are *B. anthracis*, botulinum toxin, ricin, T-2 mycotoxin, and Variola virus, the causative agent of smallpox. Some experts articulate that Iran is developing the capability to deliver biological agents by Scud missiles, aircraft, or other aerosolization techniques. According to the CIA, the Iranian Shahab missile is reportedly competent of carrying biological warheads.

On March 3, 2008, the US Office of the Director of National Intelligence (ODNI) released its Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions. The report states “our assessment of Iran’s biotechnology infrastructure indicates that Iran probably has the capability to produce large-quantities of some Biological Warfare (BW) agents for offensive purposes, if it made the decision to do so.”<sup>6</sup>

Iran’s biological facilities are based in Amir Kabir University of Technology, Biotechnology Institute of the Iranian Research Organisation for Science and Technology, Damghan, Iranian Research Organisation for Science and Technology. In January 1997, Iran created an organisation called the Iranian Biotechnology Society (IBS), which provides an umbrella organisation to bring together various institutes and individuals focusing on biotechnology related research. IBS has several branches and over 350 members.

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# Kaleidoscope

## ICRC (International Committee of the Red Cross)

The International Committee of the Red Cross (ICRC) is a private funded humanitarian organisation, headquartered at Geneva, Switzerland. The mandate of ICRC is to protect the victims of international and internal armed conflicts. Such victims include war wounded, prisoners, refugees, civilians, and other non-combatants.

The ICRC operates under the tenets of International humanitarian law (IHL). The IHL comprises of the Geneva Conventions and The Hague Conventions, and customary laws. IHL defines the conduct and responsibilities of belligerent nations, neutral nations and individuals engaged in warfare, in relation to each other and to protected persons, usually meaning civilians.

As part of its mandate to promote the implementation and development of international humanitarian law, the ICRC seeks to ensure that weapons in use and under development conform to the existing rules.

Combatants are prohibited to use weapons which are inherently indiscriminate or which are of a nature to inflict suffering greater than that required to take combatants “out of action”. Weapons which violate the “dictates of the public conscience” may also be prohibited on that basis alone. The use of weapons which cause widespread, longterm and severe damage to the natural environment is prohibited. Certain weapons like biological, chemical, blinding laser or incendiary weapons or bullets which explode or flatten easily in the human body are regarded as inhumane.

The work of ICRC to curb the use of biological and chemical weapons in warfare can be traced to the First World War. Apart from its humanitarian efforts, the ICRC in its quest to have humanitarian law adapted to new realities, launched an appeal in February 1918, calling on the belligerents to stop using poison gas.<sup>1</sup>

The ICRC considers any use of biological agents to cause illness, death or fear to be utterly repugnant and abhorrent acts.

The ICRC initiative on Biotechnology, Weapons and Humanity was prompted by the risk that new technologies from life sciences could be put to hostile use. The centrepiece of the ICRC initiative is an appeal to governments, the scientific community, the military and industry to recognise the risks, the rules and their responsibilities in this domain.

Moreover, the ‘Biotechnology, Weapons and Humanity’ initiative is designed to promote more adaptive implementation of practical measures to prevent the use of the life sciences for hostile purposes, both by individual actors and in improving synergy between them. The ICRC describes this as the ‘web of prevention.’

When launching the appeal in 2002, the ICRC proposed a Ministerial Declaration on Biotechnology, Weapons and Humanity. Whilst States were favourable in principle, there was no consensus as to the optimal timing for adoption of such a Declaration. In parallel, successful outreach to the scientific community has been achieved via specific roundtables in London, Moscow and Kuala Lumpur, numerous contacts with scientific institutions and by publication of a brochure “Preventing hostile use of the life sciences”

The centrepiece of the ICRC’s initiative is an appeal to governments, industry, science and medical communities, the military and civil society. This public appeal was launched on 25 September 2002.

Prior to the public launch of this appeal there was a meeting of government and independent experts in Montreux, Switzerland, to discuss issues in the fields of biotechnology, biological weapons, international law, ethics and social responsibility.

Since the launch of the appeal, the ICRC has been working with actors in the life sciences to promote awareness of the norms against

poison and the deliberate spread of disease and the need for preventive action, in conjunction with their responsibilities.

The ICRC initiative on 'Biotechnology, Weapons and Humanity' was prompted by the need to reduce the risk that the life sciences will be used to the detriment of humanity. It is intended to provoke thoughtful reflection on the risks, rules and responsibilities related to advances in this area.

## **Endnotes:**

- 1 <http://www.cicr.org/Web/Eng/siteeng0.nsf/98457d54a6ddbe7cc1257of300431b5e/2fdbd8239od1cd18c1256b66005e78e4!OpenDocument>.



## ARMS CONTROL

### ASEAN Regional Forum Mulls New Terrorism Defense Activities

The Association of Southeast Asian Nations Regional Forum is considering new initiatives aimed at helping member states work together to combat terrorism and other criminal activities, Kyodo News reported.

The group's members would organise tabletop drills and workshops and share technical expertise under the *ARF Work Plan for Counterterrorism and Transnational Crime*, a strategy paper that envoys at the ASEAN Regional Forum are expected to endorse it.

The organisation might eventually focus on countering chemical, biological, radiological and nuclear attacks. "The future work of the (ARF on counterterrorism) must be practical, action-oriented and concrete," the paper states. "While there are other important aspects of international counterterrorism cooperation, ARF should focus its own work on the areas where it could bring the most added value given its geographic focus, participation or past work," it adds.

The strategy calls on countries to step up their biological terrorism preparedness efforts and to better secure materials, equipment and knowledge that could support the development of biological weapons.

"The dual-use ... nature of biological science, for both peaceful and non-peaceful purposes must be addressed to both prevent bioterrorism and continue biological science development for peaceful purposes," the document states. "This will also build safe, secure and sustainable capacity to combat infectious diseases, thereby meshing international security and public health priorities."

The forum includes the 10 ASEAN member nations — Brunei, Cambodia, Indonesia, Laos,

Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam — as well as Australia, Bangladesh, Canada, China, East Timor, the European Union, India, Japan, Mongolia, New Zealand, Pakistan, Papua New Guinea, Russia, Sri Lanka, North Korea, South Korea and the United States.

[http://www.globalsecuritynewswire.org/gsn/nw\\_20090722\\_5334.php](http://www.globalsecuritynewswire.org/gsn/nw_20090722_5334.php)

### Chemical Weapons in Baltic Sea Remain a Threat, Lithuania Says

Lithuania called for continued attention to the danger posed by chemical weapons dumped decades ago in the Baltic Sea, the Baltic News Service reported.

"We would like to highlight that chemical weapons dumped at sea pose a threat to the entire international community," acting Lithuanian Foreign Minister Vygaudas Usackas said in a statement. "Therefore, this issue has to be permanently raised in international organisations and frameworks."

The Baltic Sea was used as a repository for tens of thousands of tons of chemical weapons confiscated from Germany after World War II, according to a 1995 report from a working group of the Helsinki Commission.

[http://www.globalsecuritynewswire.org/gsn/nw\\_20090721\\_9461.php](http://www.globalsecuritynewswire.org/gsn/nw_20090721_9461.php)

## DISARMAMENT

### Russia's Maradykovsky Facility Destroys First Ton of Sarin

Russia's Maradykovsky facility has destroyed one ton of sarin gas, the first of 231 tons of the deadly nerve agent that the site plans to eliminate by the end of the year, ITAR-Tass reported.

The effort to dispose of the substance at the

Maradykovsky facility — which has stored more than 40,000 sarin bombs and missile warheads for half a century — is being overseen by several groups, including the United Nations. The effort is part of Moscow's 2006 pledge to destroy its stockpiled chemical weapons by 2012.

The Maradykovsky plant is the third Russian facility to begin the chemical weapons disposal process.

[http://www.globalsecuritynewswire.org/gsn/nw\\_20090730\\_9302.php](http://www.globalsecuritynewswire.org/gsn/nw_20090730_9302.php)

## **Continued Commitment Needed on U.S. Chemical Disarmament, OPCW Chief Says**

A leading international nonproliferation official is urging the United States not to retreat from providing sufficient funds to accelerate the complete elimination of the U.S. stockpile of chemical weapons.

“We hope that ... every [funding commitment] will be completed in good time for the facilities to be completed in good time and be able to destroy the remaining chemical weapons in good time,” said Rogelio Pfirter, director general of the Organisation for the Prohibition of Chemical Weapons.

The Defense Department's Assembled Chemical Weapons Alternatives program stands to receive about \$550 million in fiscal 2010 as it continues construction of demilitarization plants at the Blue Grass Army Depot in Kentucky and the Pueblo Chemical Depot in Colorado. That would be a nearly 30 percent hike in resources from this year, and news reports indicate that the organisation could collect \$1.2 billion in extra funding over several upcoming budgets.

The Pentagon has destroyed more than 60 percent of its chemical arsenal, which was stored for decades at nine locations. The Colorado and Kentucky sites will be the last two installations to begin — and presumably complete — destruction of their stockpiles. As it stands, the end is more than a decade away.

Proposed ACWA funding in the next budget is “substantially sufficient for a one-year effort,” Pfirter said in a June telephone interview with *Global Security Newswire*. There should be no letdown in spending, he said: “It will take much more than that just to complete the facilities.”

Pfirter was in Washington last month for his first meetings with Obama administration officials at the White House and the State and Defense departments, along with lawmakers on Capitol Hill.

During the subsequent interview, he avoided discussing details of the visit. However, the former Argentine diplomat said he left convinced that the new U.S. leadership is engaged on meeting its commitments under the international Chemical Weapons Convention.

The United States is one of 188 member nations to the 1997 pact that prohibits the development, production, stockpiling, use or proliferation of chemical warfare materials such as mustard blister agent and the lethal nerve agents VX and sarin.

Any nation that joins the pact while in possession of banned armaments — the list to date encompasses Albania, India, Iraq, Libya, Russia, the United States and a publicly unidentified nation widely understood to be South Korea — is required to destroy those weapons and any production capabilities.

“The administration fully recognizes the convention and is totally aware. It doesn't need anyone else to remind them,” Pfirter said. “The commitment is very, very strong toward the convention. I'm sure the United States will continue to look for ways of bringing their own destruction program in line with the convention.”

Officials in Washington also said little about Pfirter's day and a half of talks. One congressional source said Pfirter met for a short time with then-Representative Ellen Tauscher (D-Calif.), who has since become undersecretary of state for arms control and international security. The two discussed the challenges facing the U.S. disarmament program, the source said.

“There was no big strategy discussion. I think it was a courtesy call on his part,” according to the Capitol Hill official.

The administration’s public face on arms control has to date been squarely aimed at nuclear weapons, with President Barack Obama in April giving a highly publicized speech in Prague on disarmament. More recently, the U.S. president signed a pledge with his Russian counterpart to draw down their nations’ strategic nuclear arsenals.

“The State Department and Defense Department have taken President Obama’s Prague speech as their marching orders. So they view the president’s top arms control priorities as entirely nuclear, with much less of a focus on the other categories of WMD,” said chemical-weapon expert Jonathan Tucker, a senior fellow at the Washington office of the James Martin Center for Nonproliferation Studies.

Concerns in the intelligence community regarding the threat of terrorists developing and using chemical weapons have not resulted in new international policy initiatives, Tucker said. The White House has also not scheduled any sort of meeting on chemical-weapon issues similar to a planned August session on biological threats, he added.

Meanwhile, the State Department has yet to appoint a high-level diplomat to replace the Bush administration’s envoy to Pforzheim’s organization, which monitors compliance with the convention, Tucker said. That position will be crucial for preparing Washington to deal with the diplomatic fallout expected when it inevitably misses the chemical-weapon disarmament deadline set by the document.

## **A Pressing Schedule**

The convention originally set a deadline of April 29, 2007, one decade after its entry into force, for its member nations to do away with their chemical stockpiles. In 2006, all declared arsenal holders but Albania received schedule extensions, with the United States and Russia being given a full five extra years.

In the intervening years, Albania, India and South Korea have all completed their chemical demilitarization work. The Defense Department, though, has acknowledged its inability to eliminate its weapons on time.

“The DOD review has concluded that there are no realistic options available to destroy the complete U.S. stockpile by the CWC deadline of April 2012,” the Pentagon said last May in a report to Congress.

The latest plan calls for the Army Chemical Materials Agency around that time to complete destruction operations at storage sites that held 90 percent of the U.S. chemical warfare holdings. The organization by June 30 had eliminated more than 63 percent of the original U.S. arsenal of 31,500 tons of warfare materials. The remaining 10 percent would be eliminated by 2021 by the Assembled Chemical Weapons Alternatives program, according to the report.

Washington now has less than three years to persuade other CWC member states that delays in the destruction of its chemical stockpile are the result of factors beyond its control and that it is doing everything it can to meet its treaty obligations. Failure to do so could result in international criticism or more concrete penalties.

The best outcome for the administration would be that, rather than blaming or punishing the United States, the organization’s members simply require the Pentagon to eliminate whatever remains of its stockpile within a specified period of time, Tucker said. If U.S. officials fail to prepare the ground diplomatically, however, they should expect to face a blast of rhetoric when the deadline passes, he added.

Also possible, though less likely, is that OPCW member nations collectively or individually could impose sanctions against the United States, such as stripping it of its voting rights within the organization or cutting off trade in dual-use industrial chemicals listed in the pact.

“It’s hard to predict what the political dynamic in the OPCW will be in April 2012. Obviously

it's essential for the United States to begin preparing now to make a convincing case," Tucker said. "The total quantity of CW agent that still remains to be destroyed ... will also be significant."

"Already countries like Iran have been highly critical of the United States and I anticipate that that criticism will only increase, so it's important that other CWC member states be seen as sympathetic to the U.S. position. That will take a fair amount of persuasion, I think," he added.

U.S. diplomats are likely to argue that the treaty drafters set unrealistic deadlines that failed to account for the technical and political challenges involved in destroying chemical-weapon stockpiles in a safe and environmentally responsible manner, Tucker said. The United States could also point to recent increases in Pentagon funding as an illustration of its commitment to the spirit — if not the letter — of the treaty, he said.

Should diplomatic efforts prove persuasive, the United States might receive a pass similar to the one granted Albania, Tucker said. The Adriatic nation had to overcome technical difficulties in destruction of its 16.7-metric-ton arsenal of warfare materials but finished operations several months after the treaty-set deadline without sustaining any repercussions, he said.

In deciding against penalizing Albania, the OPCW Executive Council invoked a paragraph in Article 8 of the convention, which states: "In its consideration of doubts or concerns regarding compliance and causes of noncompliance ... the Executive Council shall consult with the states parties involved and, as appropriate, request the state party to take measures to redress the situation within a specified time."

Officials at the State Department told GSN they could not discuss a situation that is several years from being realized.

"Of course people are aware of the present [schedule] estimates," Pfirter said. It is a political and diplomatic issue that will be "attended to," he said.

## The Deadline at Home

Beyond the convention deadline is the December 31, 2017, end-date demanded by Congress for complete elimination of the U.S. stockpile. That is also almost certain to be missed; as recently as last September, the military estimated that disposal operations at Blue Grass and Pueblo would have barely begun by then, much less finished.

The two installations have been beset by a variety of problems over the years. Federal legislation forced the Defense Department to find alternatives to destruction of weapons using incineration, the process used at most other sites. Military planners ultimately chose to employ chemical neutralization, but progress on the plants themselves has been slowed by major funding fluctuations — as the wars in Afghanistan and Iraq drew away money — and a mandate for redesigns to restrict costs.

The projects, though, have been on an upswing in recent years. The ACWA program received \$427 million in this budget year, and lawmakers have already added \$5 million to the Pentagon's \$545 million request for fiscal 2010 as it makes its way through Congress. The next fiscal year begins October 1, 2009.

Construction of the primary demilitarization facilities is now under way at both sites, with crucial equipment being installed at Pueblo, according to a June update from the program. The United States can use the extra money to draw closer to the congressional deadline, but it will not meet it.

"To achieve the congressional destruction mandate of 2017, only transporting portions of the stockpile to currently operating destruction facilities showed any reasonable probability of success, and this option is precluded by law," according to the Pentagon report.

The document recommends an expedited disposal program in which the program receives additional resources through several budgets — annual funding that one expert said would be roughly equivalent to the amount requested this year, which would constitute a \$250 million

yearly increase over previous estimates — and all warfare agents, munitions and waste are treated on-site at the Colorado and Kentucky installations. Carrying out the effort would involve increasing personnel to allow for faster construction, an early beginning to testing of the plants and expanding disposal operations from four to seven days a week, 24 hours per day.

Neutralization of more than 2,600 tons of mustard agent in Colorado would begin in May 2014 and end in September 2017 — three years ahead of existing schedule estimates. The Kentucky plant would begin operations in October 2018 and finish elimination of 523 tons of mustard, VX and sarin in May 2021 — two years earlier than anticipated. Speeding the pace of work would actually save about \$235 million, bringing lifetime costs for the ACWA program to \$8.2 billion, the Defense Department found.

Spending on the entire chemical demilitarization effort would exceed \$35 billion, according to the DOD estimate. The strategy outlined in the document appears to reflect the administration's plan for the program.

“The current path forward is to use the fiscal resources in the FY 2010 president's budget request to accelerate the ACWA program to achieve destruction of the Colorado stockpile by 2017 and the Kentucky stockpile by 2021,” a Pentagon spokesman stated by e-mail.

Assuming the funding comes through, the Defense Department is likely to meet its present goal of finishing off its prohibited arsenal 12 years from now, said Paul Walker, security and sustainability director for the environmental organisation Global Green USA.

“It's a little too late to play complete catch-up. But the catch-up they're playing is a good sign,” he said.

Walker argued, though, that the schedule could be cut by another one or two years through certain measures, such as use of explosive detonation chambers to destroy mustard-filled munitions at Blue Grass before the demilitarization plant itself is operating.

Pfirter, who has a year left in his eight-year stint as OPCW chief, acknowledged the challenges ahead. However, he also asserted that even the most recent target dates are not set in stone.

The Defense Department in 2006 estimated that operations at all existing disposal plants would be less than 70 percent complete by 2012, Pfirter noted. The latest assessment has all but two facilities wrapping up operations by then and just 10 percent of the stockpile remaining.

“We look forward to further estimates that will show further substantive progress in the pace of destruction, so as to ensure elimination is achieved,” he said.

[http://www.globalsecuritynewswire.org/gsn/nw\\_20090722\\_8989.php](http://www.globalsecuritynewswire.org/gsn/nw_20090722_8989.php)

## NATIONAL AND INTERNATIONAL DEVELOPMENTS

### Swine Flu Shock – Is it a Biological Weapon?

As type A (H1N1) flu continues its relentless toll in Thailand, seemingly largely defeating preventative measures, there are disturbing reports that the flu is not one type but, in fact, already a cocktail of human, avian and swine viruses. Which means most antidotes will be ineffective, especially if it turns out to be an ‘escaped biological weapon’; one of the latest claims!

Ever since the type A (H1N1) flu virus came to Thailand, there have been confused and often misleading statements in the media and from the government regarding the true statistics about the number of people infected in Thailand. Initially, great store was put in the thermal sensors installed at the airports being able to effectively prevent the virus entering via this portal, that is until the Minister of Health expressed his concern about travelers dodging the checks! The sensors have obviously been ineffective.

Wikipedia ([http://en.wikipedia.org/wiki/2009\\_swine\\_flu\\_outbreak](http://en.wikipedia.org/wiki/2009_swine_flu_outbreak)) is normally an informative source, as they are supposedly furnished with the latest updates by the Health Ministry, but although the statistics on deaths is more accurate than MCOT, one of the government media outlets, the number of infections on both sources is woefully out of date, if reports by Pongphon Sarnsamak in 'The Nation', published on July 23, are anything to go by "Dr Kamnuan Ungchusak, spokesperson for the Disease Control Department, said the ministry estimated the "real" number of people who had caught the typeA (H1N1) flu strain in the three months since the outbreak hit the country in early May was about 440,000. This was based on a ratio of about 10 deaths per 100,000 people infected with the new virus. "

In the same article, it stated "Disease Control Department spokesperson Dr Suppamit Chunsutiwat estimated that between 6 to 30 million people would get the new flu virus with about 600 to 1,200 people likely to die because most people do not have immunity." This contrasts with Prime Minister Abhisit Vejjajiva statement that his administration would not allow the number of fatalities "to exceed 1,000."

The World Health Organisation (WHO) has estimated that up to 2 billion people could be infected worldwide if the current outbreak worsens; this especially if the strain mutates. Thai medical officials, Chulalongkorn University virologist Dr Yong Pooworawan for one, are at pains to point out that currently there has been no mutation in Thailand. One is forced to add – AS YET! It can only be a matter of time.

A recent WHO report maintained the H1N1 flu virus definitely has the potential to unpredictably mutate into a more virulent form, resulting in a pandemic that may circle the globe in at least two or even three waves. In June, it was reported that a new H1N1 virus mutation, a subtype strain named A/Sao Paulo/1454/H1N1, has already been isolated in a 26-year-old patient in Brazil.

The WHO chief Keiji Fukuda at a press conference in May suggested "Perhaps a third of the world's population could be infected

with this virus, based on previous pandemic." A statement reinforced by The Imperial College London, which maintained that swine flu has a 'full pandemic potential' as it may infect one-third of the world's population, currently standing at 6.774 billion (US), within the next six to nine months, adding that the new virus can infect one out of every three individuals who come into contact with an H1N1 patient. The virus also seems to target the young and healthy; a disturbing parallel with the 1919 Spanish flu.

By far the most worrying speculations, however, concern reports that suggest the A-H1N1 virus, may be a biological weapon, which escaped or may have been stolen from a U.S. Army Medical Command test lab, although the WHO and the U.S. government have been quick to deny such claims.

Speculation has been sparked because the H1N1 flu virus is described as a completely new strain, an intercontinental mixture of human, avian and swine viruses, from America, Europe and Asia, never previously seen. According to a source known to former NSA official Wayne Madsen, "A top scientist for the United Nations, who has examined the outbreak of the deadly Ebola virus in Africa, as well as HIV/AIDS victims, concluded that H1N1 possesses certain transmission "vectors" that suggest that the new flu strain has been genetically-manufactured as a military biological warfare weapon.

Madsen claims that his source, and another in Indonesia, "Are convinced that the current outbreak of a new strain of swine flu in Mexico and some parts of the United States is the result of the introduction of a human-engineered pathogen that could result in a widespread global pandemic, equivalent to the 1919 Spanish flu epidemic.

"Chad Jones, spokesman for Fort Meade, said CID is investigating the possibility of missing virus samples from the U.S. Army Medical Research Institute of Infectious Diseases, the Army's top bio-lab," accordingly to The Frederick News. The USAMRIID also studies various pathogens, including ebola, anthrax and plague.

It wouldn't be the first time that a government laboratory has been the source of disease outbreaks: in the UK, the 2007 outbreak of foot and mouth disease was traced to a government lab, and there was a significant outbreak of a new form of swine flu in the U.S. which originated from the army base at Fort Dix, New Jersey.

<http://www.pattayadailynews.com/shownews.php?IDNEWS=0000009894>

## **Global Insights: Worse Than Swine Flu?**

Thanks to the assets and strategy developed during the past decade, the United States has thus far effectively managed the swine flu (H1N1) threat. The resources, plans, and authority now at the federal government's disposal have enabled it to respond to a major health crisis that caused more serious problems in other countries. The Bush administration left a robust toolkit for the Obama team, which for its part has used it well. Cooperation among federal, state, local, private, and other important actors has been effective in distributing public face masks, implementing mass inoculation campaigns, and taking other timely responses.

At present, the government and the nation's scientists are in a race to see whether they can mass-produce and distribute a safe and effective vaccine for the H1N1 influenza virus before the flu season starts in the northern hemisphere this fall. And we have a good chance of winning.

The effective response to H1N1 influenza suggests that the United States also has strong assets for dealing with a domestic bioterrorism incident. Unfortunately, under certain conditions, the deliberate use of a dangerous biological agent as a weapon could represent a much more severe threat than swine flu, which in itself is not as serious an influenza threat as several previous disease outbreaks. In particular, H1N1 has a lower lethality rate than other biological agents.

The current epidemic has exposed weaknesses that, if left unattended, could present major problems when dealing with more dangerous

public health challenges. We must exploit the unwelcome opportunity presented by the current H1N1 experience to reassess existing strategies and capabilities for countering the full range of biological threats.

One of the unique challenges of biological warfare is recognizing early — before the dangerous agent can kill and spread — that an attack has indeed occurred. Biological agents are often odourless, tasteless, and invisible. The symptoms produced by biological weapons are frequently confused with those caused by naturally occurring diseases.

Yet, the present network of BioWatch Generation 2 sensors deployed in most major American cities, though an improvement over the surveillance systems operating before September 2001, relies on obsolete technology and practices. They monitor only a limited number of pathogens at some 30 large urban areas by collecting airborne particles onto solid filters. Every day, someone must retrieve these filters and transport them to state and local public health laboratories for analysis.

Experts fear that this lengthy and cumbersome process would not provide sufficient early warning of a biological threat for timely medical and other countermeasures. They advocate an upgraded nationwide surveillance system that detects a wider range of potential biological threats, requires less labour-intensive intervention on a routine basis, has lower operating costs (such as through enhanced automation), and continuously communicates data through secure wireless networks to round-the-clock watch centers.

The United States also needs to upgrade communications, surveillance, and public health networks as well as the laboratories involved in managing a domestic biological emergency. Another problem is the growing shortage of private health care workers such as nurses, physicians, pharmacists, laboratory technicians, and respiratory therapists. In addition to beds, hospitals lack the surge capacity to meet the demands of a major bioterror attack, given these shortages.

The large number of uninsured and underinsured Americans also represents a major public health vulnerability, since these groups often eschew seeking medical care until they are severely sick. This could potentially delay recognition of a biological threat and complicate post-infection treatments that require timely medical intervention.

Yet, funding for health-preparedness programs has been declining since 2007, and the recent U.S. recession has accelerated this trend. The current fiscal crisis has resulted in sharp reductions in federal, state, and local spending on preparing for bioterrorism and other major public health threats.

Given the likely persistence of shortages due to these resource constraints, public health care authorities and medical providers need to improve planning to alter their operational procedures during a major emergency, including by adjusting standards of care, providing assistance at alternative sites, and managing workforce surge issues.

Funding is also an issue with respect to vaccines. The immediate focus of public health efforts is to develop a safe and effective vaccine for the swine flu. The Obama administration recently announced it would allocate \$1.8 billion to develop the vaccine ingredients, plan immunization campaigns, and assist the Food and Drug Administration to review the proposed vaccine before using it on the general public. But after overcoming the current emergency, it is imperative that we return to the original U.S. goal of having the manufacturing capacity by 2011 to produce, within six months of the identification of a pandemic, sufficient vaccine to protect every American against a virus.

Finally, the question arises how best to conduct the mass-inoculation campaign required to administer these vaccines in an emergency. The current system works tolerably well in the case of seasonal influenza, when vulnerable Americans receive shots at their doctors or clinics. But it is inadequate for responding to a more serious or faster-spreading biological pathogen. The United States has never developed or rehearsed a rapid, mass-inoculation system. It will require intimate

cooperation among diverse public and private sector actors, who will need to collect, administer, and monitor the widespread use of the vaccine.

A superior public-private partnership is also needed to conduct robust biomedical research and development. Not only are improved vaccines and equipment required to better address existing biological threats, but additional instruments are needed to address new threats — whether from the mutation of existing natural diseases or from the deliberate creation of new biowarfare agents.

At present, it typically takes over a decade and almost \$1 billion to develop a single pharmaceutical product. The Food and Drug Administration only approves one out of every five drugs that enter clinical trials. Measures are needed to decrease these costs and delays.

The government and the pharmaceutical industry need more mutually supportive policies. The United States currently lacks the capacity to manufacture sufficient vaccine for Americans' domestic requirements, let alone to support foreign nations in need. Conversely, relying on foreign vaccine producers is an unwise geopolitical strategy and leaves the United States vulnerable should foreign governments understandably decide to prioritize the inoculation of their own citizens.

The advances of the past decade have left the United States well-prepared for the current challenge of the swine flu pandemic. But more needs to be done to plan and prepare for the potential demands that a biological attack or naturally occurring pathogen might place on the nation's rapid-response medical capabilities.

<http://www.worldpoliticsreview.com/article.aspx?id=4132>

## **UN chief urges Iraq and Kuwait to find alternative to Iraqi payment of \$24 billion debt**

Secretary-General Ban Ki-moon urged Iraq and Kuwait to discuss alternatives to payment of the \$24 billion debt Baghdad owes Kuwait as a



result of Saddam Hussein's 1990 invasion of its tiny neighbour.

In a report to the U.N. Security Council reviewing all Iraq-related resolutions adopted after the Kuwait invasion, Ban suggested the possibility of converting the outstanding payments into investments that would meet Iraq's reconstruction needs "and be beneficial to the region as a whole."

He noted that this possibility was discussed during the recent visit to Kuwait by the speaker of Iraq's Parliament, and he encouraged discussions on alternative solutions to continue.

Iraqi Prime Minister Nouri al-Maliki urged the Security Council's most powerful members to cancel all sanctions and more than 70 resolutions adopted after the Kuwait invasion, saying Iraq is now a democracy that poses no threat to international peace and security.

The council decided on December 22 to review all post-invasion resolutions and asked the secretary-general to consult the Iraqi government and report his findings so the council can take action allowing "Iraq to achieve the status it enjoyed prior to the adoption of such resolutions."

In his 19-page report, Ban said that nearly two decades after the invasion the situation "is yet to normalize fully," though both countries have been making progress toward resolving some issues.

Ban stressed that "a high degree of political will on both sides is still required to achieve this."

Iraq currently pays 5 per cent of the proceeds of all oil and gas sales into a U.N. Compensation Fund, but al-Maliki, citing the ongoing financial crisis, has been pressing to lower the payment to 1 per cent or eliminate payments altogether.

Ban said the \$24 billion owed to Kuwait is mainly related to oil sector losses following the invasion, including the cost of extinguishing oil well fires and damage to government buildings and ministries. In addition, Kuwait seeks some \$1.2 billion to settle an environmental claim.

Noting Iraq's obligation to contribute to the Compensation Fund and its request to lower or eliminate payments, the secretary-general said: "I strongly encourage Iraq and other stakeholders to actively discuss alternative solutions to the issue of outstanding compensation and debt payments, including through investments, in the mutual interest of Iraq's people and the region as a whole."

On other Iraq-Kuwait issues, Ban urged steps that would pave the way for the two countries to take over maintenance of their border. And while Iraqi efforts have resulted in the identification of the remains of 236 missing Kuwaitis and the return of some Kuwaiti property, the secretary-general noted that Kuwait's archives have still not been found and 369 Kuwaitis remain unaccounted for.

In May 2003, the council lifted economic sanctions against Iraq, opening the country to international trade and investment and allowing oil exports to resume. In June 2004, it lifted an embargo on the sale of conventional weapons to the government.

But there are still limits on some activities related to the possible production of nuclear, chemical and biological weapons, and missiles with a range of more than 150 kilometres (90 miles) are still banned.

[http://www.google.com/  
hostednews/canadianpress/article/  
ALeqM5gIXANjce13vsPCB6IsWRhL-dE4cg](http://www.google.com/hostednews/canadianpress/article/ALeqM5gIXANjce13vsPCB6IsWRhL-dE4cg)

## **Study Questions Anthrax Vaccine Dispersal Plan**

Floods of patients could quickly overwhelm U.S. hospitals after an anthrax attack if a government effort to distribute vaccines experienced delays, researchers concluded in an independent study published in July.

The Cities Readiness Initiative, a program of the U.S. Centers for Disease Control and Prevention, calls for emergency responders to distribute vaccinations involved in a biological terror attack within 48 hours of initial exposure.

If terrorists released anthrax in aerosol form over a major city, a mass vaccination campaign in line with federal standards would protect up to 87 percent of the exposed population from illness, provided that the effort got under way within 48 hours, said the study's authors, who developed an computer simulation of an anthrax strike's aftermath.

With each additional 24 hours, the number of untreated exposed people requiring hospitalization would rise by 2.4 to 2.9 percent, according to the researchers. Delays of more than two days in starting treatment would prompt up to 6.5 percent additional hospitalizations per day.

"Delays in detecting and initiating response to large-scale, covert aerosol anthrax releases in a major city would render even highly effective CRI-compliant mass prophylaxis campaigns unable to prevent unsustainable levels of surge hospitalizations," the report concludes. "Although outcomes may improve with more rapid epidemiological identification of affected subpopulations and increased collaboration across regional public health and hospital systems, these findings support an increased focus on prevention of this public health threat."

Computer modeling could help hospitals determine how to use their workers, equipment and other resources most efficiently, possibly enabling a clinic to vaccinate 15,000 patients in 17 hours, the researchers found.

"How hospitals and public health agencies are prepared for an attack — and how they respond to the surge in patients seeking care — will determine our success in containing an attack if one happens," said Mark Helfand, editor of *Medical Decision Making*, the journal that published the report.

[http://www.globalsecuritynewswire.org/gsn/nw\\_20090729\\_3437.php](http://www.globalsecuritynewswire.org/gsn/nw_20090729_3437.php)

## **Pentagon drill helps local agencies prepare for possible attack**

Arlington, Virginia- Emergency crews from across the area, military helicopters, and nearly

100 volunteers were part of a drill testing the response to a possible biological attack.

The drill kicked off with a slow moving pickup truck spraying a harmless powder in the South Parking Lot of the Pentagon.

Volunteers walked around the parking lot as the spray powder misted through the sky.

Many volunteers who were involved in the 2007 drill tell WTOP that drill went smoother than two years ago. Some volunteers say that the emergency response personnel were clear on their responsibilities and that made a big difference.

Local officials tested whether decontamination on volunteers could be achieved by using a high pressure spray from a fire truck hose or if a scrubbing was necessary. Officials say the answers will come in the weeks ahead and that's what they need since there is not enough research on what to do in case an attack occurs.

Bonnie Regan, Deputy Director of Emergency Management in Arlington County, says learning which process works better is key to developing a good response plan to a biological attack.

"We are looking at what is effective," she says. "What would be really great is that we find that and we can clean people effectively with the least number of resources."

Another key part of the drill focused on the use of helicopters during a possible biological attack.

The drill included the landing of a helicopter in the parking lot with the harmless powder on the ground and then a second landing with the ground washed over. One Pentagon Force Protection Agency official wanted to know if landing a helicopter would cause particles from a biological weapon could be carried through the air.

The drill lasted three hours. The Pentagon Force Protection Agency expects to release a final report later this month.

<http://www.wtop.com/?nid=25&sid=1715782>

## U. S. Opens Way to Ease Sanctions Against Syria

The Obama administration said that it would take new steps to ease American sanctions against Syria on a case-by-case basis, the latest sign of a diplomatic thaw.

Administration officials said the message was conveyed to President Bashar al-Assad of Syria in Damascus by President Obama's Middle East envoy, George J. Mitchell. Mr. Mitchell said the American government would try to expedite the process for obtaining individual exemptions to the sanctions, which prohibit the export of all American products to Syria except food and medicine.

The move will particularly affect "requests to export products related to information technology and telecommunication equipment and parts and components related to the safety of civil aviation," said a State Department spokesman, Andrew J. Laine.

While the shift does not change the letter of the law of the sanctions, which were passed by Congress in 2003 and cannot be modified without Congressional consent, administration officials said it was significant because it indicated a change in how the White House would view requests by companies for waivers to sell their wares to Syria.

It is also another notable instance of the Obama administration opening the door to Syria on what it calls a basis of mutual interest and respect — and as part of a broader strategy of trying to get the country to turn away from its alliances with Iran and Islamic militant groups. In June, the administration said it would send an ambassador to Syria for the first time since 2005.

Under the Syria Accountability Act, as the sanctions are known, the president can work through the Commerce Department to grant exemptions for national security reasons in one of six categories, including one that allows for the sale of airplane parts to ensure safe civil aviation. Under the Bush administration,

however, a limited number of such exemptions were granted.

"We are going to look at these waivers, especially on airplane spare parts, and our predisposition is going to be, view them favorably, as opposed to the prior administration's policy," said a senior administration official who spoke on the condition of anonymity because he was not authorized to discuss the matter.

The decision to move toward eased sanctions was first reported in *The Wall Street Journal*.

The sanctions have powerful backers in Congress, and the initial reaction against any effort to ease them was swift.

Representative Ileana Ros-Lehtinen of Florida, the ranking Republican on the House Foreign Affairs Committee, said she was "deeply troubled that the United States would make unilateral concessions to the Syrian regime and ease pressure on Damascus, even as the State Department recently reported to Congress that Syria continues to pursue advanced missile and chemical, biological and nuclear weapons capabilities and to sponsor violent Islamist extremist groups like Hezbollah and Hamas."

Representative Eliot L. Engel, a Democrat from New York, who helped write the sanctions bill, said that while granting such exemptions was "perfectly legal" under the act, he would urge caution. "Syria, from what I can see, has not changed its spots," he said.

Mr. Mitchell's visit to Syria for talks with Mr. Assad was his second trip there in two months. Administration officials said that Mr. Mitchell and Mr. Assad also tentatively agreed that a future delegation from the United States Central Command and Iraq would travel to Damascus, Syria's capital, and discuss greater cooperation in securing the Syria-Iraq border against insurgent traffic, a high priority of the Obama administration.

<http://www.nytimes.com/2009/07/29/world/middleeast/29syria.html>

## **NATO Wants Training Ground With Toxins And Viruses**

Croatian Defence Ministry has turned down NATO's proposal on constructing a training ground centre against terrorist attacks with biological, chemical and nuclear weapons, the Jutarnji list daily writes.

If the proposal had not been rejected, this would have been the biggest training ground in Europe with large amounts of chemicals and viruses. Its construction would cost 15 million kuna.

The main reason why Americans want a training ground for war gases in Dalmatia is because it has a long period with nice weather, which enables nearly 8 months of active training.

However, the ministry's opinion about the centre is negative. The ministry has turned down the construction of the centre, however, it does not oppose that this or some other company purchases or uses the abandoned warehouse.

Douglas Eaton, Knotox director, believes that the Croatian Defence Ministry needs such a centre. Despite the fact that most poisonous biological and chemical weapons would be used in the centre, Knotox claims that the chemicals which would be used in drills would not be in contact with the environment or harm the local population, plants and animals.

[http://www.javno.com/en-croatia/nato-wants-training-ground-with-toxins-and-viruses\\_271866](http://www.javno.com/en-croatia/nato-wants-training-ground-with-toxins-and-viruses_271866)

## **RECENT DEVELOPMENTS IN SCIENCE AND TECHNOLOGY**

### **Scientists Develop Bat - Like Biodeceptor**

U.S. scientists have developed an airborne biological weapons-detection drone that is based on a bat, complete with flapping wings, United Press International reported.

The solar-powered, self-guiding "micro-aerial vehicle" is approximately the size of a bat and borrows its anatomical elements: Developers at North Carolina State University designed its skeletal and muscular structures to imitate that of the winged mammal.

"We have used a shape-memory metal alloy that is super-elastic for the joints," said designer Stefan Seelecke in an interview with the London Daily Telegraph. "The material provides a full range of motion, but will always return to its original position — a function performed by many tiny bones, cartilage and tendons in real bats."

The drone, still a prototype, is intended for military use to detect biological warfare materials and conduct general surveillance.

[http://www.globalsecuritynewswire.org/gsn/nw\\_20090709\\_2519.php](http://www.globalsecuritynewswire.org/gsn/nw_20090709_2519.php)

### **Scientists Develop System for Making Paper Biodeceptors**

A team of Canadian researchers has developed a mechanism for making paper biological-weapon sensors using an ink similar to the material in printer cartridges, United Press International reported.

The ink would be made up of biocompatible silica nanoparticles engineered to change color upon contact with a specific biological agent, according to the team led by McMaster University associate professor John Brennan.

The researchers at the Ontario university said they hope to develop an inexpensive, easily transported and fast-acting means of testing for toxins and disease agents .

[http://www.globalsecuritynewswire.org/gsn/nw\\_20090716\\_8436.php](http://www.globalsecuritynewswire.org/gsn/nw_20090716_8436.php)

### **Australia starts human trials of H1N1 vaccine**

Australia began its first human trials of a swine flu vaccine.

More than 700 people have died from the H1N1 virus worldwide, the World Health Organisation (WHO) claims. The WHO commissioned an independent research into the correlation between one of its vaccine programs in Africa and S.E. Asia and the subsequent outbreak of AIDS. The report found that smallpox vaccines were contaminated with combined sheep and cow viruses which could only have been done in a lab. The WHO suppressed and never released the report until now, which was then published in the Times newspaper of London science section many years ago.

The 'swine flu' (North American Influenza H1N1) trials will be conducted on some 600 adult and child volunteers at the Royal Adelaide Hospital in South Australia. They will be receiving two injections of the vaccine, three weeks apart.

Doctors will analyze the participants who have got both standard and increased dosage and look to find at what dose they develop an appropriate immune response, according to their press releases.

Melbourne-based CSL company will test the vaccine for the H1N1 virus.

"We appreciate that new influenza strains like the swine flu can surprise us with properties that mean they might require higher dosing and two injections rather than one to provoke the desired level of immune response in humans," Dr. Russell Basser, CSL's global director of clinical development, said in a statement.

Australia is among the countries worst-hit by the H1N1 virus originated in the United States and which then passed to Mexico where it achieved notoriety.

Canada has reported H1N1 cases which are resistant to Tamiflu.

The H1N1 outbreak came after the Baxter pharma company which manufactures vaccines, was found to have vaccines contaminated with bird flu type viruses.

There is currently a legal case being brought against against Baxter AG, Baxter International

and Avir Green Hill Biotechnology AG "for manufacturing, disseminating, and releasing a biological weapon of mass destruction on Austrian soil between December 2008 and February 2009 with the intention of causing a global bird flu pandemic virus and of intending to profit from that same pandemic in an act that violates laws on international organised crime and genocide."

<http://mathaba.net/news/?x=621168>

**Compiled by:** Wg. Cdr. Ajey Lele,  
Dr. Monalisa Joshi and Gunjan Singh

## **Globalization and WMD Proliferation: Terrorism, transnational networks, and international security** By James A. Russell and James J. Wirtz (editors) (2008): Routledge

Prashant Kumar Singh

*The author is a Research Assistant at IDSA, New Delhi.*

### Summary

This book puts forward a point that ‘states’ and ‘governments’ are not the only proliferators of the Weapons of Mass Destruction (WMD) in the age of globalization. Instead, non-state proliferators (‘super-empowered’ people like Pakistani scientist A.Q. Khan) have also emerged as a major carrier of proliferation during these days. Therefore, applying only traditional perspective of ‘security dilemma’ and overlooking the non-state proliferators in appreciating this problem will leave serious gaps in understanding the present dimensions of the problem. On a broader level, this book tries to comprehend whether globalization is fundamentally transforming the nature of proliferation. Besides, it also tries to determine how real is the threat of the WMD’s falling into the hands of terrorists.

The rationale of this book is that in the age of globalization states and governments are not the only proliferators of the Weapons of Mass Destruction (WMD); instead, non-state proliferators have also emerged as a major carrier of proliferation. Therefore, investigating this issue from traditional perspective – which considers the proliferation of WMD from the perspective of “security dilemma” in the state-based international system – without taking the role of extra-state proliferators into account will not be able to provide holistic view of the issue. As this book rightly claims, the exposure of the illegal nuclear supply network woven by Pakistani scientist A.Q. Khan has let it be known that the proliferators independent of states can proliferate the WMD on the strength of their own. This book makes an attempt to understand how communication, transportation and financial network are “facilitating or constraining trade in dangerous contraband”. Besides, it also tries to determine how real is the threat of the WMD’s falling into the hands of terrorists. On a broader note, it tries to develop an understanding whether the processes of globalization are fundamentally transforming the nature of proliferation.

The book puts forward an assertion that the problem of transnational proliferation networks should be seen in due proportion instead of unrealistically hyping it up. It asserts that some interested individuals and local groups have become powerful enough to forge a nexus among terrorism-criminals-WMD by manipulating facilities provided by globalization, though this phenomenon remains an aberration only. The reason behind this preposition is that the locus of these networks remains highly individual-centric and are not state-sponsored groups, though they work in relatively permissible and familiar politico-administrative environment. Therefore, their capabilities remain very limited. However, this book does not suggest that these individual-centric transnational groups should not be taken seriously. Instead, it categorically maintains that these groups involve an element of unpredictability and are capable of giving surprise, which makes them dangerous.

In this context, it is argued that states need to

adjust their security policies vis-à-vis this new threat as this threat poses double paradox. The paradox on international level is that international institutions and regimes meant for curbing proliferation can exert pressure on governments, but these groups, run by 'super-empowered individuals', remain outside their ambit. They are not mandated for doing that. And, the paradox on national level is that governments find themselves in such a predicament where if they deny people access to information and knowledge in the name of curbing the proliferation, it becomes counter-productive and if they do not, the curbing becomes very difficult. In this scenario, ensuring non-proliferation is a tricky proposition.

This book is an edited volume in which a number of scholars have explored various issues concerning the problem of proliferation using globalization as a security paradigm. The book has broadly investigated three themes. First of all, it has analyzed how globalization has enhanced the capabilities of individuals and local communities to affect the world scenario through the proliferation. Secondly, it discusses the theme of proliferation per se. The second theme focuses on both horizontal and vertical non-traditional proliferation. In horizontal spread of the WMD, primitive WMD reach local groups and individuals, while in vertical spread governments acquire advanced WMD. The third theme produces the picture of the limitations of capabilities of the traditional defence apparatuses in tackling the proliferation of the WMD.

In the first theme, it refutes that the proliferation is a necessary corollary of globalization. It asserts that globalization has come to benefit people and provide them with opportunities. However, it is altogether different matter that some rogue individuals are trying to exploit these opportunities. In the second theme, it deals with separate issues, types and cases of the proliferation. This book covers Pakistani scientist A.Q. Khan's notorious proliferation ring with fair details. It separately covers near-term threats of chemical weapons terrorism. It has done a study on relatively unexplored area of unmanned air vehicles as terrorist weapons. Under the second theme, it has tried to establish

the link among transnational organised crime, terrorism and nuclear trafficking. Its finding is that "while the links between drug smuggling and nuclear trafficking were clearly identifiable, such links with weapons-smuggling rings were weaker". Incidentally, this book has probed constituency constraints on al-Qaeda regarding violence. Its assertion is that al-Qaeda is dependent on constituency support for survival and the world-wide Muslim community in general does not endorse apocalyptic methods of warfare. Therefore, al-Qaeda being an ideologically motivated organisation cannot overlook larger religious notions and beliefs of its constituency. As a part of the third theme, this book has studied constraints that intelligence agencies encounter in detecting and investigating the acts and incidents of proliferation.

On the whole, the book places capabilities of non-state proliferators of the WMD in proper perspective and the complex situations that traditional states have to face in dealing with clandestine acts of some individuals.

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**Submissions:** IDSA invites contributors to submit researched papers, articles and view points. Contributions may deal with matters of contemporary debate or historical analysis related to Chemical and Biological Weapons/Terrorism/Disasters. The magazine carries three categories of contributions: full-length analytical papers of 2000-3000 words; articles of 1500-2000 words and view points of 800-100 words. The magazine also welcomes book reviews of 700-1000 words.

Contributors are requested to follow the guidelines and style given below.

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- The paper should be composed using MS Word 6.0 and above.
- The paper should be sent by email to the editor. It should be typed in Times New Roman, Font size 12 and 1.5 line spacing.
- All diagrams, charts and graphs should be referred to as Figures and consecutively numbered (Fig.1, Fig.2, and so on). Tables should carry only essential data and should complement the text rather than repeat what has already been said. They should carry a short title, be numbered (Table 1) and carry the source at the bottom. Each table must be referenced in the text.
- If actual statements or phrases are taken from another paper, the name of the author should be mentioned in the text and the chosen material should be placed within quotation marks with an appropriate reference. Alternatively, if another author's views are to be summarised, use the formulation: 'The views of xyz are summarised'; give a crisp summary. It is a good practice to reference sources of information extensively and effectively.
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### *References and notes*

Notes should be sequentially numbered and listed at the end of the article. Details of references to sources should be included in the notes. Authors are responsible for the accuracy of the references.

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