RANSAC

Russian American Nuclear Security Advisory Council
2005 Congressional Seminar Series
Seminar 2: "Biological Threat Reduction: Opportunities and Obstacles"

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On May 20, 2005, the Russian American Nuclear Security Advisory Council (RANSAC) held the second session of its 2005 "Congressional Seminar Series" on key issues concerning the U.S.-Russian security relationship. The session highlighted opportunities and obstacles to addressing biological threat reduction.

Summary of remarks by **Anne Harrington**, Director of the National Academy of Sciences' Committee on International Security and Arms Control:

Ms. Harrington addressed the risk of biological proliferation in Russia and Eurasia. She outlined five sources of risk for biological proliferation: expertise, facilities, materials, unstable sociopolitical environments, and the proximity of the region to the Middle East. Regarding expertise, the thousands of scientists, engineers, and technicians involved in bioresearch and development possess skills that could contribute to biological weapons programs. Dozens of research, production and design facilities still remain throughout the former Soviet Union, posing a proliferation risk. Information on the extent and location of biological materials remains sparse, even within the Russian government. Dangerous pathogen collections exist at many of these sites. Efforts have been made to locate these materials and to take initial actions to safeguard them in order to prevent illicit transfer. The unstable sociopolitical and economic environment in the region, exemplified by the current unrest in Uzbekistan, pose a danger to the security of biological institutes and materials. Finally, the facilities' proximity to the Middle East make them particularly tempting targets for biological materials theft by terrorist groups. Several unsuccessful incidents of nuclear materials transfer have been discovered, and biological materials could follow the same trafficking networks.

The U.S. has been engaged with key bioinstitutes in the region since 1994, and expanded that involvement in 1997. Several U.S. government agencies oversee programs focused on responding to the biological proliferation threat including the Departments of State, Defense, Health and Human Services, Agriculture, Energy and the Environmental

Protection Agency. In 2001, the White House review of biothreat reduction programs encouraged the expansion of these programs. Internationally, Canada, the United Kingdom, and the European Union are all funding projects and activities related to reducing the biological threat. In particular, Canada has made a major contribution under the G-8 Global Partnership. Among non-governmental organizations, the Nuclear Threat Initiative and the Civilian Research and Development Foundation have implemented projects and encouraged dialogue that has sensitized policymakers and the public to the importance of the biological threat. In addition, the International Science and Technology Center now devotes 40% of their budget to funding biological institutes and research. On the Russian side, increased attention to the problem has resulted in competitive grant programs for bioresearchers in order to absorb their expertise and discourage proliferation.

Ms. Harrington stressed that biological proliferation remains a risk. Biological researchers have not been sufficiently redirected to alternative careers. The Russian government plans to reduce the overall number of Russian science research facilities from 2,600 to 1,600 by 2010. The scientists with biotechnology expertise from these disbanded facilities will need to be re-employed in peaceful civilian research. The State Department's Bio-Industry Initiative is a model for how it has engaged bioresearch and production facilities and has made progress in ensuring their sustainability. However, inadequate progress has been made on securing biological materials.

However, Ms. Harrington insisted that real progress has been made in reducing the biological threat. Access to and transparency of bioinstitutes in Russia and the former Soviet Union have increased in recent years. Also, a small but developing private biotech industry has emerged in Russia with the capacity to absorb some expertise. Certifications and standards for biological research have been increasing. Linkages to other institutes and the business sector has strengthened the viability of the Russian biotech industry.

Ms. Harrington outlined a series of challenges facing biological threat reduction efforts. The first is money. Currently, biological threat reduction programs are not funded in a way that promotes their long-term success. A project-by-project funding approach will not provide for long-term stability. Individuals are also needed to champion biological threat reduction policy within the Russian and American governments. Traditional views of cooperative threat reduction primarily as a program to secure nuclear material have constrained innovation and capacity building in the biological field. There is a need to coordinate and complement US and G-8 Global Partnership efforts in the biological field. More flexibility is needed in implementing agreements between outsiders and Russia. A new threat assessment regarding biological weapons is needed that is not constrained by Cold War thinking. Finally, several programs have had extraordinarily successful access and engagement with Russia in implementing biological threat reduction measures. What

is needed is consideration of how to expand this success into more difficult situations such as North Korea.

Summary of remarks by **Dr. Gerald Epstein**, Senior Fellow for Science and Security at the Center for Strategic and International Security:

Over the past several years, an evolution has taken place in the consideration of the biological threat. Once seen as a state-based threat perpetrated by militaries, non-state actors are increasingly showing their ability to use biological materials to advance their goals.

Dr. Epstein's Biological Threat Reduction project at CSIS is examining a range of efforts needed to properly address this treat, including dissuasion, denial of access to capabilities and materials, and defending against and responding to bio attacks. The project also looks at other nations' efforts in combating the biological threat. Actors who have not traditionally focused on international security are now being asked to prepare to defend against biological attacks. The public health, law enforcement, and scientific communities are all becoming involved. They can provide new mechanisms to defend against the biological threat that have not been readily available in the confines of the diplomatic and military communities. Furthermore, international cooperation among all these actors is essential, because the problem of biodefense and biosecurity is international.

Several mechanisms, both formal and informal, exist to combat the biological threat. Established international institutions such as the World Health Organization and treaties comprise the formal structure of the biological nonproliferation regime. Other collective actions, in the form of resolutions and funding, have also bolstered the regime. United Nations Security Council Resolution 1540, which requires UN member states to deal with non-state threats within their jurisdiction, and increased international nonproliferation funding to the former Soviet Union are two examples. While international action against the biological threat is important, improving domestic capacity and ability to act in countries around the world will encourage a proactive outlook that will be more effective in combating the threat than simple reaction.

The motivations for nations to combat the biological threat remain diverse due to the lack of consensus as to the nature of the threat. A wide range of opinions exists on the seriousness and form of the threat and the immediacy with which it needs to be combated. This lack of agreement stems from the gap between the absence of past biological attacks, on the one hand, and the known ability, particularly as technology continues to evolve, to produce biological weapons that could generate very serious consequences. The United States, for example, takes the biological threat more seriously

than others due to the perception that it is more likely to be attacked than another country. International cooperation is difficult to achieve when the seriousness of the threat cannot be agreed upon.

Several barriers inherent in the threat impede effective responses. The biological threat represents both a security and a public health problem. This combination means that although both the security and public health communities will play an essential role in responding to a biological attack, both communities must recognize that in some ways, a deliberately induced epidemic is unlike anything that either community is used to dealing with. While some of their problem-solving skills will remain necessary, both may have to abandon some of the assumptions they bring from their respective fields and approach the threat as new. For example, the culture of secrecy present in the security community may hamper cooperation with other domestic and international actors.

Cooperation in countering bioterrorism can also be stymied by the dual-use nature of biological technology and facilities, particularly in the realm of biodefense -- activities undertaken by a state in order to counter the threat may be seen by others as actually contributing to the threat. Finally, many developing countries face a trade off between biological security and public health problems in deciding where to allocate scarce resources. When insufficient public health resources are available to deal with endemic health threats such as HIV and malaria, it will be difficult to convince officials that they should devote some of these to preparing for possible smallpox or anthrax attacks in the future.

Measures must be taken at every stage of dissuading, impeding, countering, or responding to a biological attack. No single measure, by itself, is likely to be very robust, making it important to layer on as many impediments to the malicious use of biology as possible. The Biological Weapons Convention, for example, codifies an important norm against the possession of biological weapons. Efforts at dissuasion could also be improved by making more biological weapons activities criminal acts and giving law enforcement authorities greater power to intervene. For example, until recently, law enforcement authorities in the United States had to prove intent to use a biological agent as a weapon in order to conduct an investigation or bring a prosecution. The mere possession of biological agents– even ones that had been developed as weapons in the past, such as anthrax -- was not illegal. Also, Interpol's increased interest in bioterrorism and global law enforcement will help strengthen international cooperation in combating the threat. UN Security Council Resolution 1540, which obligates states to criminalize biological weapon-related activities short of actual use, calls for increased export controls on biological materials and technology as well. As biotechnology advances and its dual-use properties increase, however, export controls will become less effective. Finally, with these biotechnology advances, the scientific community is increasingly working in a

security-based environment. However, with the intellectual freedom that is essential to the conduct of world-class science, biological research that could potentially be misapplied can become part of the public domain, available to be exploited by anyone.

Intelligence funding and sharing are also becoming important tools to combat the biological threat. Epidemiological surveillance can be used to pinpoint outbreaks of infectious disease. The World Health Organization unfortunately has little resources to conduct such surveillance and must rely on countries to make voluntary contributions to support its outbreak investigations. Also, the WHO's public health mission, and its need to gain access to nations where disease outbreaks have occurred, require it to maintain a strict perception of neutrality that it believes would be threatened were it to work too closely with the law enforcement or security communities.

Foreign repositories of pathogens with sloppy control procedures present a proliferation risk for biological material. While increased security for these facilities is needed, it remains difficult for developing countries to adequately fund and implement these security upgrades. The screening of personnel with access to biological agents presents another security problem. Stronger international standards should be adopted in verifying the background of potential employees. However, it will be difficult to internationalize requirements that, like those in the United States, prohibit citizens of certain countries from gaining access to certain biological agents. Countries are not likely to agree on which other countries' citizens should be prohibited from access.

The response capacity of different international agencies and organizations should be constantly evaluated and improved. The Global Health Security Action Group, consisting of the G-7 countries plus Mexico, and national Ministries of Health have all conducted drills to test their ability to respond to biological crises. Nongovernmental entities have also conducted such simulations; for example, an international exercise called Atlantic Storm, conducted in January 2005, simulated a wave of smallpox attacks against civilians in several different countries and tested the ability of political leaders to allocate scare resources such as smallpox vaccine.

Finally, although international collaboration on countermeasures to the biological threat remains essential, states' wish to protect national biological industries – and therefore to seek to retain R&D or procurement investments within their borders, and possibly to limit sharing of information or technology – may pose some barriers.

Summary of remarks by **Elisa D. Harris**, Senior Research Scholar at the Center for International and Security Studies at the University of Maryland:

Ms. Harris discussed the impact of advances in biotechnology on security, including the need to manage the risks from "dual-use" research -- i.e., research that can be used for both peaceful and destructive purposes.

Several incidents in recent years have stimulated concern about the potential misuse of biotechnology, either as a consequence of legitimate research or because of deliberate malfeasance. In January 2001, researchers in Australia published the results of an experiment in which mice were injected with a genetically modified mousepox virus as part of an effort to develop a contraceptive for controlling the mouse population. However, this variant of mousepox turned out to be highly lethal, even for mice that were previously vaccinated against the disease. In September 2001, the anthrax letter attacks against Congress and American journalists further highlighted the risks from biological agents that had been optimized for destructive effects. These and other events have caused a surge of concern about bioterrorism and increased worry that terrorists would use advances in the life sciences to create new biological agents to use in attacks.

Ms. Harris then reviewed three major developments in recent years designed to respond to this threat: the Fink Committee report, President Bush's Biosecurity Initiative, and the expansion of research efforts for bioterrorism and biodefense.

In October 2003, the Fink Committee of the National Academy of Sciences issued a report entitled "Biotechnology Research in an Age of Terrorism." The Committee's report was important in a number of respects. First, it clearly articulated the threat, stating unequivocally that biotechnology research is dual-use and could cause disruption or harm, potentially on a catastrophic scale. It also outlined a number of thoughtful recommendations for beginning to address this problem. One was to expand the National Institute of Health's guidelines for recombinant DNA research to include seven types of "experiments of concern," and to require a review of the biosecurity risks of such experiments before they are conducted. A second major recommendation of the committee was the establishment of a National Science Advisory Board for Biodefense to help develop and oversee implementation of these new guidelines.

In March 2004, the Bush administration responded to the Fink Committee's report with its own Biosecurity Initiative, the centerpiece of which was the creation of the National Science Advisory Board for Biosecurity. According to its charter, this new advisory body will be responsible for developing guidelines for local and national oversight of dual-use research; developing a code of conduct for scientists and laboratory workers; developing education and training programs on biosecurity issues; developing guidelines for the dissemination of research results; and fostering the extension of the US measures to the international arena. Unfortunately, although it has been more than a year since the Board was announced, its members have not yet been appointed and its first meeting will

not be for another six weeks, at the end of June. Thus, while the Bush Biosecurity Initiative represents a start, the U.S. government clearly needs make the dual-use issue a higher priority.

Finally, there has been a significant expansion in recent years of research efforts in bioterrorism and biodefense. For example, the bioterrorism budget of the National Institutes of Health has increased 3200% , from $53 million in fiscal year 2001 to over $1.8 billion (requested) in fiscal year 2006. Much of this money is being directed to biodefense research. NIH is also funding a 20 fold increase in BL-4 laboratory space, nine new regional biocontainment labs with BL-2 and BL-3 capabilities, and eight new regional centers of excellence for biodefense and emerging infectious disease research. Thousands of researchers are taking advantage of these funding opportunities to begin to work on dangerous pathogens, including over 11,000 researchers that have been approved to work with so-called select agents. A National Biodefense Analysis and Countermeasures Center is also being established at Ft. Detrick which, among other things, will do biological agent research that falls squarely in the areas the Fink Committee identified as "of concern," including work on susceptibility to therapeutics, environmental stability, aerosol dynamics and host-range studies.

In the end, however, the proposals developed by both the Fink Committee and by the Bush administration will not result in adequate oversight either over this expanded bioterrorism research effort or over the activities of other researchers whose work could be misused for destructive purposes. First, both fail to include key parts of the life sciences research community as well as industry. Second, neither involve binding, enforceable obligations. Finally, neither properly address the international dimension of the dual-use problem, focusing instead on the domestic situation.

The strategy proposed by the Center for International and Security Studies at the University of Maryland, by comparison, is comprehensive, mandatory, and global in scope. The oversight approach envisioned would involve a case-by-case review of certain types of research projects before they are undertaken to assess any potential security implications. The proposal would also require the licensing of researchers and institutions engaged in potentially dangerous research. These obligations would apply to all relevant institutions, whether government, industry or academic. They would be binding. And they would be harmonized internationally, so that researchers beyond the United States follow similar procedures and rules.

After the September 11, 2001 attacks, the need for enhanced oversight of dual-use research has become an imperative. While Ms. Harris remains concerned about the possibility of a bioterroist attack against the United States, she stressed the danger of inadvertently destructive consequences resulting from advances in biotechnology as well

as from the dramatic increase in work with dangerous pathogens in the context of bioterrorism prevention. While the Fink Committee and the Bush Biosecurity Initiative are useful first steps in reducing the biological threat, they do not go far enough. A system of oversight for dual-use research needs to be put in place that would apply to all relevant research institutions, would be mandatory, and would be global in scope.