Written Testimony of
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U.S. Senate Committee on Appropriations
Labor/Health and Human Services/Education Subcommittee
September 29, 2010

Mr. Chairman, I speak today on my own behalf, but based on knowledge I have acquired during the past decade. I previously served as the chairman, Department of Military Strategy and Operations at the National War College, and the founding director of the Institute for Homeland Security. Last year, I served as the executive director of the Congressional Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, and currently serve as the CEO of The WMD Center, a not-for-profit research and education organization that former Senators Bob Graham (D-FL) and Jim Talent (R-MO) created as a follow-on to continue the work of the WMD Commission—and there is much work to do.

Our first mission at the WMD Center is to ensure that senior leaders in both the public and private sectors understand the threat of 21st century bioterrorism—a subject not well understood by many leaders in both the legislative and executive branches of government. I have concluded this based upon the actions and inactions of the federal government.

- In the past year, there have been numerous attempts to raid the BioShield Strategic Reserve Fund for non-defense programs.
- Organizations, such as the Food and Drug Administration (FDA) are not seen as critical components on America's national security team. Considering the threats we face, both from both from bioterrorism and newly-emerging diseases, FDA needs to be funded with the same vigor as the Pentagon's latest weapons systems. Unfortunately, it's not.
- No one is in charge of America's biodefense enterprise. No individual has responsibility, authority, and accountability for a program that is vital to America's long-term national security. To the best of my knowledge, there are more than two-dozen Presidentially-appointed, Senate-confirmed individuals with some responsibility for biodefense. Yet, not one of them has it for a fulltime job, they answer to no one in common, and no one is in charge. I do not think that is the organizational structure that will lead to success.

Mr. Chairman, I am convinced that if senior leaders understood the threat we face today, and even more importantly, the threat we will face tomorrow, there would be someone in charge of America's biodefense enterprise, and a clear policy and sufficient funds would be available to properly defend America.

The threat of bioterrorism we face today is far different than that of the 20th century. During the Cold War, only nation-states were capable of producing sophisticated biological weapons. However, as the biotechnical revolution began to accelerate in the latter days of

the 20th century, the Defense Science Board recognized the national security implications of these rapid changes in the seminal DSB report, *Biological Defense*, June 2001. The technology that had once been limited to major powers was rapidly becoming available to small nations and some non-state actors.

> "…major impediments to the development of biological weapons – strain availability, weaponization technology, and delivery technology – have been largely eliminated in the last decade by the rapid global spread of biotechnology. There is no way the U.S. can control the spread of rapidly advancing biotechonology." (page 18)

What was unknown to the members of this Defense Science Board was the fact that while they were preparing their report al Qaeda terrorists in Afghanistan and Malaysia were in the process of developing anthrax weapons for use in the United States. Thankfully, al Qaeda did not complete their weapons development program before 9/11, and shortly after 9/11, U.S. troops discovered and dismantled the laboratories.

Nobel Laureate, Dr. Joshua Lederberg and Dr. George Whitesides, the former chairman of the chemistry department at Harvard University, co-chaired this Defense Science Board task force. More than nine years have passed since they warned us about the national security implications of the rapid changes in biotechnology. Those nine years represent several generations––a great leap forward in biotechnology. The vast majority of these new capabilities represent good news for our families and nation in terms of medical care and public health; however, there is also a dark side to this rapid progress.

Mr. Chairman, I am concerned that many leaders in the legislative and executive branches of the federal government do not understand the dark side of this progress—the nature of current and future threats of bioterrorism. There are four key issues that are not well understood:

1. history of biowarfare, including the former U.S offensive biowarfare program,
2. the current technologies available to non-state actors,
3. the interest of terrorist organizations in using biological weapons,
4. and the fact that this is not an intractable problem

For the past 11 years, I have provided briefings on bioterrorism in a course sponsored by the Joint Staff's Anti-Terrorism and Force Protection directorate (J-34) to more 3,500 senior military officers. More than 70% of these officers filled out the critiques at the end of my presentation, and by far, the most common statement on these critiques is: "Why hasn't anyone told me about this?"

Considering the fact that so many senior military officers are not well versed on this threat, it should be of no surprise that individuals outside the field of national security are even less well-informed. To properly understand the threat of 21st century bioterrorism, it is essential to have a basic understanding of the history of the use of bioweapons.

In virtually all cases, biological weapons have been used in a terroristic mode––to attack civilian populations. They are not reliable weapons on the battlefield. They would of little value if there was a strong wind, bright sunlight, rain, or any combination thereof. However, if one's goal is to attack a city, and there is no specific date and time to do it, then they can become very effective tactical or strategic weapons.

When I discuss 250 years of biological terrorism in my presentations, beginning with British soldiers giving Native Americans blankets contaminated with smallpox, to German agents attempting to infect horses and mules in our ports during World War I, and the Japanese dropping bombs filled with plague-infested fleas on Chinese cities, I say that the theories of these early-day bioterrorists were sophisticated, but their technologies were not.

During the early days of the Cold War the United States, the Soviet Union, Great Britain and other nations reached a point where technology finally caught up with the level of theory. This was demonstrated in numerous tests in the United States, and by the fact that in the 1960s, many of America's war plans included the use of biological weapons.

I find it surprising how few citizens, and even senior military officers, actually know that America had a powerful offensive biological warfare capability until Richard Nixon unilaterally shut down America's offensive of program on November 24, 1969.

When America's offensive biological warfare program began in the 1940s, it was low-tech and not capable of producing weapons of mass destruction. Major investments were made in the 1950s and significant advances were made in technical capabilities. By the late 1960s, America's capabilities for the use of biological warfare was rapidly approaching the equivalence of nuclear weapons (in terms of casualties).

After America's unilateral disarmament in 1969, the US led the effort to get all nations to sign the Biological Warfare and Toxin Convention. After signing this treaty, the Soviet Union then ramped up their offensive program, eventually reaching a level almost beyond imagination. With more than 50,000 scientists and engineers working across 11 time zones in scores of facilities the Soviets managed to hide most of this capability from Western intelligence agencies. While the U.S. offensive program had produced hundreds of pounds of weapons-grade pathogens, the Soviets were producing hundreds of metric tons.

What is not well understood from this history is the fact that bio warfare is not just theory. Tests conducted in the United States, the Soviet Union and Great Britain confirmed beyond any doubt the capability of pathogens to serve as either tactical or strategic weapons against civilian targets—counter-value targets in Cold War terminology. There is no question that in the 1960s, 70s, and 80s this capability was only available to nation-states. What is not well understood however, is the same capability is now available to virtually any nation, and for many terrorist organizations, both international and domestic.

It was nearly a decade ago that Drs. Lederberg and Whitesides stated that the rapid advances in biotechnology had reached the point where non-state actors were capable of producing these terrible weapons. The briefings given by various government agencies to

the WMD Commission during the past two years made it clear that further advances in the biotechnical revolution have made the production of sophisticated biological weapons by non-state actors even less challenging than in 2001. Those who say that it is still too difficult for terrorists to produce and deliver sophisticated biological weapons are either unaware of the extraordinary advances in biotechnology and the recent government studies that demonstrate these capabilities, or have some other agenda that they wish to champion.

Mr. Chairman, four things must occur for a terrorist organization to develop and deliver a sophisticated biological weapon. First they must acquire a sample of the deadly pathogen such as anthrax or plague. How would a terrorist organization acquire such deadly pathogens? For the past few weeks there has been a naturally-occurring outbreak of anthrax in humans and cattle in Bangladesh. This is not terribly uncommon in many developing countries. In fact, it even occurs in the United States. In the summer of 2008, Ted Turner lost 278 buffalo to anthrax on his ranch in Montana. The buffalo died because they ate grass in a pasture that contained anthrax spores in the soil. On Monday, a state of emergency was declared in a village in south Russia's Krasnodar Territory over an anthrax outbreak in dairy cattle. If terrorists wanted to find a sample of *Yersinia pestis*, the bacteria that causes plague, they would not have great difficulty finding it in many locations west of the Mississippi River in the United States. Prairie dogs in West Texas and rats above the 5000-foot level in the Rocky Mountains often carry this deadly pathogen. Earlier this week, the Chinese reported an outbreak of plague in humans in southwestern Tibet.

Obtaining samples of deadly pathogens is not particularly difficult. In fact, all but two of the 80+ pathogens on the Select Agent List exist in nature. Pathogens that cause anthrax, plague, tularemia, Ebola, Marburg, Venezuelan Equine Encephalitis, Q-Fever and dozens of others can be obtained and isolated from diseased animals or humans.

The second step in creating a terrorist bioweapon is production. Taking a small sample of one of these pathogens from nature and producing enough material suitable for use as a weapon is a standard process used in various industries including pharmaceutical, agriculture, and pesticide. All of the equipment and supplies required for production are available on various sites on the Internet at very reasonable prices.

The third step, and the part that has always been most challenging in creating a biological weapon, is getting material to the proper particle size for airborne release. The most effective way to disseminate a biological weapon is to spray either a liquid or dry powdered form of a pathogen into the air. When in the proper particle size, the pathogen will enter the human respiratory system and then move directly into the blood stream where it leads to systemic illness.

In the 1960s and 70s it took superpower technology to create the proper particle size without causing harm to the bacteria or virus being disseminated. Today it is standard off-the-shelf technology used in the pharmaceutical and agriculture communities. Techniques far more sophisticated than what was used in the highly-classified U.S. offensive program are now openly discussed in highly-respected scientific publications such as *Journal of Aerosol Medicine and Pulmonary Drug Delivery,* and openly discussed at major conferences

hosted by organizations such as the American Association for Aerosol Research (AAAR). The AAAR conference schedule for October in Portland Oregon will include tutorials on Aerosol Mechanics I & II (http://aaar.conference2010.org/content/tutorials).

These scientific publications and organizations are incredibly important to medical research. They are important aspects of the biotechnical revolution that will make the lives of our children and grandchildren healthier and better protected from both chronic and infectious diseases that plagued our parents and grandparents. But we must understand, this same technology can be used to make weapons. We must also remember what Drs. Lederberg and Whitesides told us in 2001: "There is no way the U.S. can control the spread of rapidly advancing biotechonology." (Nor should we try. It would only succeed in reducing our defensive capabilities, and cause serious, perhaps irreparable damage to our important biotech industries.)

The fourth and final step is delivery. In October of 2001, the U.S. Congress witnessed a very low-tech and generally ineffective method of disseminating a biological weapon—the U.S. Postal Service. On the other hand, using spray devices available in most agriculture stores, and also available for sale on the Internet, to disseminate a few pounds of dry-powdered anthrax, most particularly in an indoor environment such as the subway or indoor sports arena, would have the enormous consequences of a weapon of mass destruction.

What are those consequences? They were best stated on page 1 of the November 2009 National Security Council document, *National Strategy for Countering Biological Threats.*

> The effective dissemination of a lethal biological agent within an unprotected population could place at risk the lives of hundreds of thousands of people. The unmitigated consequences of such an event could overwhelm our public health capabilities, potentially causing an untold number of deaths. The economic cost could exceed one trillion dollars for each such incident. In addition, there could be significant societal and political consequences that would derive from the incident's direct impact on our way of life and the public's trust in government.

There are some who say terrorists prefer to use bombs, and point to such recent attempts as we witnessed on Christmas day and in May in Times Square. Without question the vast majority of terrorists will continue to use conventional weapons. Those weapons are certainly capable of producing dramatic results for terrorists, such as what we all watched unfold in Mumbai; however, terrorist use of conventional weapons will not change course of history. An event, such as described in the November 2009 NSC report would change the course of history—not only for us, but for our children and grandchildren.

For those who say terrorists have no interest in biological weapons, I guess they just ignore the Aum Shinrikyo attempts in 1994-95 to produce biological weapons in Japan and disregard the al Qaeda bioweapons program. For a recent terrorist perspective on bioweapons, I suggest you watch a short video at this web site:

http://www.youtube.com/watch?v=M32M-2B2mz8. It was broadcast repeatedly on Al – Jazeera TV in February 2009 and has been viewed on the Internet more than 80,000 times.

Perhaps some of the confusion comes from assessments by the Intelligence Community (IC) on the bioterrorism threat. The IC will tell you they have little or no information of any terrorist group developing biological weapons capability. That should not be surprising.

During 15 years of the Cold War, the IC failed to appropriately identify the massive Soviet biowarfare program that consisted of 50,000 scientists and technicians working in scores of laboratories across 11 time zones. (This was the size of the Soviet's offensive biowarfare program after they signed the Biological Warfare and Toxin Convention.) The IC also missed al Qaeda's anthrax programs in Afghanistan and Malaysia, and they missed the Aum Shinrikyo biowarfare and chemical weapons programs. Thankfully, both of the Aum's weapons programs were plagued with technical errors when they went from small-scale to large-scale production.

Do we really think there is a high probability the IC will find a half dozen individuals working in a make-shift laboratory (standard bio lab equipment purchased on the internet in a facility no larger than a two-car garage) in a remote village in the tribal regions of Pakistan or Sana, Yemen or the suburbs of New York City? That is the size and scale of a facility required to produce bioweapons, according a study (BACUS) done by the Defense Threat Reduction Agency in 1999 that determined there would be no perceptible "intelligence signature" of such an operation.

For the threat of bioterrorism, the IC can provide us with sound strategic intelligence information on intent, but little or no tactical level information: status of a bioweapons program of a specific terrorist organization or the time and location of a planned attack.

I think we all understand that there are people and organizations out there that want to kill large numbers of Americans. The WMD Commission said there are two ways to do that, nuclear and biological, and by far, biological is easier. If the senior leaders in the Congress and Administration understood the biological capabilities now available—and even more troubling, what will be available in the next couple of years—to small terrorist groups, there would be no requirement for hearings such as these. Biodefense would be a top priority, and we would be making rapid progress in defending our cities, communities, and families.

I sometimes think the reason some leaders are hesitant to take the recommended actions, is that they believe the problem is intractable—it is so difficult and complex, that "there is nothing we can do". There is no question that biodefense in the 21st century is difficult and complex, but the fact is, there are actions we can take to remove bioterrorism from the category of WMD.

We cannot realistically prevent bioterrorism, but if we develop robust response capabilities, we will effectively remove bioterrorism from the category of weapons of mass destruction. We will be able "to move the decimal point to left" in that number from the November 2009 NSC report. We will not count casualties in the hundreds of thousands, or

tens of thousands, or even in the thousands. We can move the casualty count down to the scale of what we lose on America's highway on a three-day weekend—most certainly it would still be a tragedy, but not a weapon of mass destruction that would change the course of history.

The threat of bioterrorism will not diminish in the years ahead unless we take the required actions to build a robust and nimble resilience capability that includes:

- near real-time detection and diagnosis of disease outbreaks,
- situational awareness and effective communication of actionable information,
- rapid development and production of medical countermeasures,
- timely countermeasure distribution and dispensing,
- surge medical care delivery to treat the sick and protect the well,
- environmental cleanup and remediation.

If Senators Bob Graham and Jim Talent were here today, they would tell you that sufficient and continued funding in support of these programs will not only lead us to a point where bioterrorism can be removed from the category of WMD, it will also provide a deterrent against attack, and just as importantly, that these are all "no-regret investments." Building a system that provides for rapid diagnosis of disease, whether naturally-occurring or man-made; better, faster and less expensive vaccines and therapeutics; and far greater capacity for surge operations in our hospitals and clinics are the types of investments we should be making for our children and grandchildren. On that, we can all agree.

Last month the President recommended an initiative to improve our system for developing medical countermeasures (MCMs). It is, perhaps, the single most important factor for removing bioterrorism from the category of WMD, but to make it work we need to understand that organizations responsible for this new initiative—Health and Human Services/BARDA, National Institutes of Health, and the Food and Drug Administration are now critical elements of our national security community—no less important than the Department of Defense, the Intelligence Community, and the Federal Bureau of Investigation.

Mr. Chairman, the threat of bioterrorism is real and will only increase over time. As Drs. Lederberg and Whitesides wrote back in 2001, there is no way to stop the biotechnical revolution that will place ever-increasing asymmetric power in the hands of terrorists. However, that same revolution in technology can be used by America to remove bioterrorism from the category of WMD. The decision will be yours.

I look forward to your questions.