

Day 2- April 4, 2006

Regional Centers of Excellence - Academic Defense Against Bioterrorism - Olaf

Schneewind, Director, Great Lakes Regional Center of Excellence for Biodefense and Emerging Infectious Disease Research (GLRCE)

Schneewind articulated the GLRCE's mission to provide basic research for biodefense in response to federal initiatives. His center's efforts are focused in three preventative areas related to microbes: therapeutics, vaccines, and diagnostics. His center is not specifically involved in bioterrorism prevention and response, but serves as a resource to inform national security responses and policies. He referenced some of the bioterrorism threats to the United States and other nations from Class A toxins (plague, anthrax, smallpox, hemorrhagic fever, tularemia, and botulism) and opined that certain diseases such as Marburg, Avian flu, SARS, are considered to be threats because of their largely unknown societal impact. Angola's recent experience with the Marburg virus was cited as an example.

Largely, his talk analyzed four of the class A agents that could be used in a bioterrorist attack- smallpox, plague, anthrax, and botulism.

- Smallpox is a threat because, without an effective countermeasure, quarantine cannot be implemented. 1 in 1000 people has an adverse effect to vaccination and in the US today that is not tolerated. This can have an impact on how we can respond to and prevent infections. Smallpox is also a threat because it spreads rapidly. The results of the Dark Winter smallpox attack simulation in 2002 were presented, highlighting the high rate of infection spread across state boundaries, even with a localized attack in a shopping mall.
- The rules of engagement are different for plague because it starts with an animal infection. Transmission can come from a flea bite or inhalation. Protection is the most challenging element, as evidenced by the rapid spread of infections in a TOPOFF exercise in a Denver concert hall. Adding to the threat is the idea that plague samples are readily found in nature (fleas on prairie dogs).

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- Anthrax is a threat to be aware of because some strains are resistant to antibodies. In its natural form, anthrax is transmitted via spores. In its weaponized form, it can be aerosolized. The inhaled form can be lethal within 48 hours. The anthrax vaccine's effectiveness is still being documented.
- Botulism can be transmitted orally or through inhalation. One of the problems with this agent is that an infection results in long-lasting respiratory paralysis (6 months). In this case, a countermeasure would be the availability of respirators. However, we need to consider that these are limited in number across a state. Also, there is no botulism vaccine.

Schneewind then offered the insight that the real goal of his basic research in the national security realm is the development of vaccines against these agents and methods to detect such toxins in the aftermath of an attack. Real time detection would be ideal. The US response to disease outbreaks has changed over time. Today, we tolerate infectious disease less than we did years ago and adverse effects of vaccines are not welcome, making response and prevention a challenge.