

Bioterrorism and Dual-Use Technologies

Gerald L. Epstein, Ph.D.

Assistant Director for Biosecurity and Emerging Technologies
Office of Science and Technology Policy

July 7, 2016



Is Bioterrorism Really a Problem?

- It's impossible to know for sure
 - Little empirical basis for assessment
 - Finding BW programs poses challenges
- Terrorist interest in biological weapons has long been questioned
 - Little precedent or inferred desire for BW
 - Questions as to whether terrorists really sought to inflict mass casualties
- But technical trends give cause for concern
 - State programs demonstrated the lethal potential of biological weapons long ago
 - Biotechnologies continue to become more powerful and much more accessible
 - No aspect of a biological weapon is unique to weapons; each aspect has some legitimate utility for research or commerce

Challenge of Deliberate Misuse

- Political trends are also worrisome
 - 9/11 demonstrated interest in mass destruction
 - At least some terrorists today seem to want the kind of indiscriminate lethality that biological organisms can provide
- Current terrorists may be more interested in unconventional weapons
 - Aum Shinrikyo 1995 (unsuccessful) biological attacks
 - 2001 anthrax attacks demonstrated vulnerability to BW
 - Al Qaeda known to have explored BW
 - ISIS known to have used chemical weapons
- Possibility of irrational or psychopathological actors

Biotechnology Challenge

- Ever more powerful
 - Increased ability to understand and manipulate nature
 - Increased rate of development
- Ever more available
 - Widespread geographical diffusion
- Relatively low barriers to entry
 - Ever more familiar
 - Increased market penetration
 - Increased “commoditization” and growing infrastructure
- Ever more decentralized
 - State actors important but far from dominant
 - Many diverse actors

“Pervasive” Dual-Use

- Despite being potentially threatening if misused, biotechnology’s applications are so valuable that they must not only be tolerated but promoted and enhanced worldwide
- Controlling the spread of biotechnology -- even if feasible -- would be inappropriate and counterproductive

Why Might High-Tech Techniques be of Concern?

- Today's state-of-the art becomes tomorrow's craft becomes the day after's commodity
- Terrorists may specifically seek the capabilities that these techniques can provide
 - These techniques could obviate existing controls
 - They may generate desired effects
- High-tech might be what they know
 - Even if today's terrorists have generally not studied biology, tomorrow's may have – and tomorrow's biology will be even more potent than today's



Assessing Biological Threats

- At the same time, problems and uncertainties face would-be attackers
 - Full set of needed skills rarely collected together for legitimate purpose
 - There is ample opportunity to fail, reveal one's efforts, or become one's own victim
- There are few other fields with so great a gulf between proven lethal capability, on the one hand, and paucity of actual attacks, on the other

The Biological Weapons Threat

- Wrong question: “How sure am I that there is a biological weapons threat?”
 - No reason to expect that whatever limits constrained previous terrorist aspirations will apply indefinitely
- Right question: “How **sure** can I be that there isn't one?”
- I'm less worried about terrorists becoming biologists than I am about biologists becoming terrorists

Public Messaging Challenge

- Democracies do not invest to solve problems they do not know they have
- Yet calling attention to the threat sends a message to attackers as well as policymakers:

“...despite their extreme danger, we only became aware of [the potential of chemical and biological weapons] ... when the enemy drew our attention to them by repeatedly expressing concern that they can be produced simply.”

Memo apparently by Al Qaeda leader Ayman Al- Zawahiri, found on the hard drive of a computer in Afghanistan (Wall Street Journal, 12/31/2001)

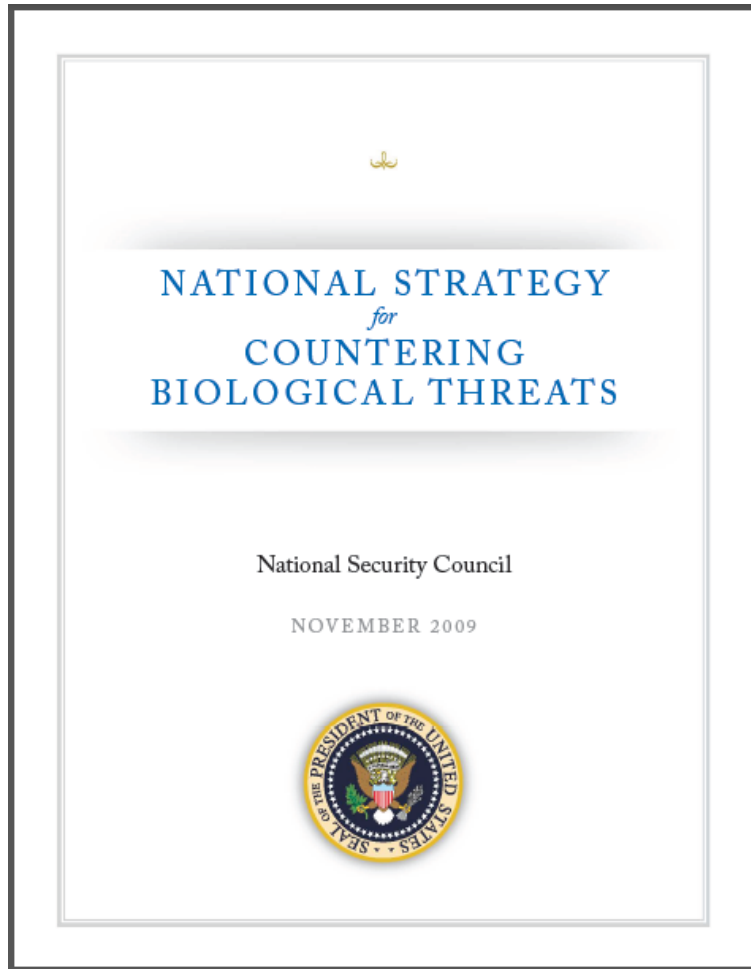
Public Messaging Challenge

- Suggested message for policymakers
 - *“Biological weapons are highly uncertain, but they could be really bad”*
- Suggested message for terrorists
 - *“Biological weapons could be really bad, but they are highly uncertain”*

Attackers do not Get a Free Ride

- Vastly more resources and innovation are being devoted to biodefense and public health than (we must assume) attackers are devoting to bioweapons
- Building resilience against infectious disease – a strong public policy objective – also builds resilience against bioterrorism
- Yet defense is a harder problem
 - It's easier to break something than fix it
 - Attackers can choose their weapons, delivery modes, targets, and times of attack -- and they do so with some awareness of the defense
 - Attackers do not wait for FDA approval of their weapons
- Can we “skew the deck” so that advances in biotechnology are more conducive to legitimate than to illegitimate uses?

One Policy Tool to Deal with Dual-Use



- Promote global health security
- Reinforce norms of safe and responsible conduct
- Obtain timely and accurate insight on current and emerging risks
- Take reasonable steps to reduce the potential for exploitation.
- Expand our capability to prevent, attribute, and apprehend
- Communicate effectively with all stakeholders
- Transform the international dialogue on biological threats