Biodefense 101 for Congressional Staff

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Biological Threat Overview
Nuclear vs. Biological Lethality

1 Megaton Hydrogen Bomb

100 kg of Anthrax Powder

Outline of Washington D.C.

570,000 - 1,900,000 Deaths

1,000,000 - 3,000,000 Deaths
Categories

- Naturally Occurring
- Accidentally Released
- Intentionally Introduced
New Threats Not as New as You Think

• Nerve agents invented in 1950 by England
• Synthetic biology invented in 1961 by France
• Biological agents genetically modified in 1980 by Russia
• CRISPR-Cas9 (gene editing) invented in 1987 by Japan
Just One Example
Ebola Signs and Symptoms

Signs and symptoms of the ebola virus usually appear 7-9 days after infection.

**Day 7-9:** Headache, fatigue, fever, muscle soreness

**Day 10:** Sudden high fever, vomiting blood, passive behaviour

**Day 11:** Bruising, brain damage, bleeding from nose, mouth and anus

**Day 12:** Loss of consciousness, seizures, massive internal bleeding, death

(Source: World Health Organization)
Underestimation

**Signs and symptoms of the ebola virus** usually appear 7-9 days after infection.

**DAY 7-9**
- Headache
- Fatigue
- Fever
- Muscle soreness

**DAY 10**
- Sudden high fever
- Vomiting blood
- Passive behaviour

**DAY 11**
- Bruising
- Brain damage
- Bleeding from nose, mouth and anus

**DAY 12**
- Loss of consciousness
- Seizures
- Massive internal bleeding
- Death

*Source: World Health Organization*
Concerns

• Can Ebola be weaponized? Yes, it already has been.
• Combined with other diseases in a weapon? Yes, it already has been.
• Didn’t Soviet research stop in the 1990s? No, last poorly explained accidental death was in 1996.
• Why is China sending specimens back from the DRC? Not sure.
What about the BWC?

- Compliance with the Biological and Toxin Weapons Convention (BWC) is extremely difficult to verify.
- US backed away from the BWC in 2002 because it needed to engage in activities that would be difficult to verify as defensive only.
- Russia uses the same language we do to describe its own activities.
National Biodefense Enterprise
Spectrum of Biodefense

- Prevention and Deterrence
- Preparedness
- Detection and Surveillance
- Response
- Attribution
- Recovery
- Mitigation
Federal Involvement

- Federal biodefense activities sometimes overlap and require coordination
  - e.g., HHS and FEMA would both respond in the aftermath of a large-scale biological event
- Federal hand-off sometimes weak as well
  - e.g., DHS Material Threat Determinations not getting to HHS in a timely fashion
- High-level strategy and leadership needed to ensure that the Nation is prepared to deal with biological threats
Current White House Biodefense Policy

- National Biodefense Strategy (SEP 2018)
- Also addressed in National Security Strategy (DEC 2017) and other national strategies
About the Panel
Study Panel Background

- Established in 2014
- Purpose: to assess gaps and provide recommendations to improve U.S. biodefense
- Perspectives provided at four day-long meetings with academia, advocacy, government, and industry
Determined where the U.S. is falling short of addressing biological events – intentionally introduced, accidentally released, and naturally occurring.
Challenge of Leadership

- The Nation does not afford the biological threat the same level of attention as it does other threats
- No centralized leader
- No comprehensive strategic plan
- No all-inclusive dedicated budget
Challenge of Leadership

• The Nation lacks a single leader to:
  • Control
  • Prioritize
  • Coordinate
  • Hold agencies accountable for working towards common national biodefense

• This weakness precludes sufficient defense against biological threats
Need to Elevate Coordination

- Inter-governmental and multi-disciplinary efforts needed
- No centralized, effective leadership directing and harmonizing efforts
- The can largely be resolved through:
  - The leadership of the Vice President of the United States
  - Establishment of a White House Biodefense Coordination Council
Need to Elevate Collaboration

- U.S. biodefense is not – nor should it be – a solely federal function
- Impact of biological events, while felt nationally, will be addressed locally
- Federal government must aid in strengthening SLTT capabilities, and increasing support to and access by SLTT, for biodefense
Need to Drive Innovation

• Need much greater focus on innovation than ever before, because:
  • Biological threats imminent
  • Biological vulnerabilities existing too long
  • Complexity of threat requires equally complex solutions

• Requires prioritization and funding to maintain any realized successes and pursue opportunity and innovation
Report Conclusions

• Critical mass of biological crisis
• Myriad biological threats, vulnerabilities, and consequences increase risk to the Nation
• Dramatic improvements within reach if we:
  • Follow a national blueprint for biodefense
  • Establish leadership
  • Engage in major reform efforts that build on good work already in place and innovates where it is not
BLUE RIBBON STUDY PANEL ON BIODEFENSE