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Asha M. George, DrPH Executive Director, Blue Ribbon Study Panel on Biodefense





Nuclear vs. Biological Lethality

1 Megaton Hydrogen Bomb



Outline of Washington D.C.

100 kg of Anthrax Powder









Categories







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





Ebola Signs and Symptoms

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



Sudden high fever. vomiting blood, passive behaviour

Bruising, brain damage, bleeding from nose, mouth and anus

DAY 11

Loss of consciousness, seizures, massive internal bleeding, deaths

DAY 12

SCORE WORLD HEALTH ORGANISATION



Underestimation

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

DAY 11



Bruising, brain damage, bleeding from nose, mouth and anus Loss of consciousness, seizures, massive internal bleeding, death₉

DAY 12



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







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)
- National Security Presidential Memorandum 14, Support for National Biodefense (SEP 2018)
- Also addressed in National Security Strategy (DEC 2017) and other national strategies





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



Base Report Released October 2015

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

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