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Abstract:

The 21st Century ushers in a different world that that which we knew or once perceived – a world in which the use of biological weapons poses a genuine threat. It is a world now in which there are individuals and groups, as well as nations, that have the capacity to produce inexpensively and to distribute organisms that have the capacity to cause serious epidemic disease and, quite conceivably, wide spread panic. The potential of a number of such biological agents far exceeds that of chemical agents. Those organisms of greatest concern result in clinical diseases that few physicians have ever seen and, until recently, relevant research centers have been sparse.

For a contagious disease such as smallpox, an outbreak anywhere represents an international emergency but the deliberate release of any agent in any country, casts an ominous shadow that no country could ignore. There is a need now, as never before, for countries to work together in elaborating strategies for strengthened intelligence regarding intent and capacity, for early detection and identification of agents and for response should a release occur.

Prof. ~~John~~ ~~Howard~~ ~~Howard~~ -

Subject of bioterrorism - is a subject of frequent speculation now / subject to a not insubstantial amount of media hype & outrageous doctordramas
This is comparatively recent as I shall note

Question is - is this a credible concern? ~~Off~~ What is the evidence?

What should we be doing about it? ~~Off~~
last years - my responsibility

What about chemical weapons? or nuclear weapons?

A word, then, in preface that focuses the biological concerns.

COLIN POWELL

STANFIELD TURNER - BW - potential to push country beyond the point of recovery.

~~Chem~~ ^{Chem} - Nuclear - explosive & recovery

BW - panic

~~22~~

22/5

Antitoxins

Chem's across country
Postal service
Part of health

10 Grams

over today - when not off

BW - inexpensive to make -

Difficult to know of its threat posed by others - 2 car garage - how people deal with

Threat best understood in the context of history -
Certain of the action now being taken

Threat of Bioterrorism –Real or Imagined?

The concept that microbes might be deliberately utilized as biological weapons is repugnant to the civilized world and, until just a few years ago, was a subject generally ignored both by those in medicine and public health. The belief of many was that for any one to use such weapons would transgress a moral barrier which had not been breached since World War II; others were confident that to produce and disseminate organisms was beyond the capability of most who would profess terrorism; and many considered the prospects of biological weapons use to be as unthinkable as the concept of a nuclear war and the so-called nuclear winter. The 1973 Biological Weapons Convention, signed by most nations, including the Soviet Union and Iraq, offered an added level of assurance.

Events that have occurred or come to light within the past decade have shown each of these elements of confidence to be without foundation. The Soviet Union in 1992 officially acknowledged that it had breached the 1973 Convention in biological weapons programs that presumably are still continuing. The program was as large as its nuclear initiative, embracing more than 60,000 scientists. It “advanced” the science of bioterrorism with a large and capable cadre of biologists, many of whom have dispersed to other countries. Iraq, likewise, was found to have an active program, primarily focusing on anthrax but working with other organisms as well. Finally, a previously unknown apocalyptic religious group in Japan demonstrated its ability to grow large quantities of organisms and showed its interest in disseminating the material to cause large numbers of casualties.

If there was doubt that biological agents could be released or the potential problems that would be encountered in dealing with such a release, the dissemination of anthrax through the United States Postal Service in October 2001 vividly dramatized the potential problem. An estimated 10 grams of anthrax powder in 3 envelopes caused 22 cases of whom 5 died. It served to shut down an important segment of the postal system; tens of thousands of specimens were processed in the U.S. and other countries; and an important component of the Senate of the United States had to be evacuated. Persons throughout the country were fearful of opening their mail.

With rapidly growing competence in biotechnology throughout the world; with complete information on how to weaponize and distribute organisms now available on the internet; and with terrorist groups now active who have no apparent moral scruples toward using biological weapons, there is every reason to believe that the threat of bioterrorism is not only real but that it is growing and predictably, will be with us for a very long time.

Pleasure - thanks for inviting me.

Bioterrorism - a continuing and pervasive concern.

Of WMD - most greatly feared because of their potential

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Bioterrorism: the Current Threat

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Biological Weapons

- A threat, largely ignored until 1995
 - Too difficult to grow
 - Technologically difficult to disseminate
 - So potentially destructive as to be unthinkable
 - Seldom used because of an inherent moral barrier that none would transgress

Biological weapons use -1900-72

UNIT 731

- 1940-44 - Japanese used weapons on many occasions to attack Chinese cities and troops
 - Anthrax, botulism, brucellosis, cholera, dysentery, gas gangrene, plague, paratyphoid, typhoid
- 1942 --Russians used Tularemia at Stalingrad

Biological weapons -1973-95

- Biological Weapons Convention -1973
 - Countries pledge to destroy weapons and cease all research on offensive weapons
 - Signed by US, USSR, Iraq, et al
- Academia -- Medicine and Public Health
 - Activity of any sort re: biological or chemical weapons shunned
 - Little research or training re: exotic diseases that are prime candidates for use as weapons

MORALLY
REPUGNANT

1995 --Watershed events Iraq

- Hussein Kamal deserts
 - Research reports reveal a much more extensive and sophisticated program than UNSCOM had been able to uncover
- Concern: If so much activity could continue undiscovered despite UNSCOM and other intelligence, how many other countries might be similarly engaged?

1995 - Aum Shinrikyo in Japan

- Religious cult releases Sarin gas in Tokyo subway
 - Cult - previously unknown to intelligence
 - Thousands of members, well-funded
 - Tried to aerosolize anthrax and botulinum toxin throughout city at least 8 times
 - Organized team to go to Congo to obtain Ebola virus
- Concern - unknown, non-state sponsored organization, acting without concern for possible moral deterrents

Full, Final, Complete

1995 – USSR Program

- Essentially unknown until 1989 deserter
- 1992 – Ken Alibek, Deputy Director of USSR bioweapons program, deserts to U.S. and by 1995, information he provides is widely known and confirmed
- Bioweapons program consisted of 60,000+ persons in 50 different labs.

"On May 8, 1980, WHO announced that smallpox had been eradicated..Soon after, smallpox was included in a list of biological weapons targeted for improvement in the 1981-85 Five-Year Plan..."

Where other governments saw a medical victory, the Kremlin perceived a military opportunity...the military command issued an order to maintain an annual stockpile of 20 tons (of smallpox virus)."

Alibek, 1998

Russia today

- More than half of the scientists are no longer working in the old biological weapons labs. Many have gone abroad
- The major production lab for smallpox virus, at Sergiyev Posad, remains a secret facility
- The major viral weapons research lab continues work on smallpox, Ebola, et al
- Former Vice-Minister of Health Burgasov admits (2002) aerosolized smallpox was released on Voz Island in 1971 for studies

Criterion Rating of Bioagents

Anatoliy Voroboyov –April 1994

■ Smallpox	26	■ Q fever	20
■ Plague	23	■ Marburg	18
■ Anthrax	21	■ Influenza	17
■ Botulism	21	■ Melioidosis	17
■ VEE	20	■ Typhus	15

New World Coming

"While conventional conflicts will still be possible, the most serious threat to our security may consist of unannounced attacks on American cities by sub-national groups using genetically engineered pathogens."

U.S.Commission on National Security/21st Century
15 September 1999

Biological Agents of Greatest Concern

- | | |
|------------|--|
| ■ Smallpox | ■ Tularemia |
| ■ Anthrax | ■ Botulinum Toxin |
| ■ Plague | ■ Hemorrhagic fevers
Ebola, Marburg, etc. |

Agents that, if released, could threaten the integrity of civil government

Alternative Methods for Dissemination

- Water
- Food or beverage
- Vector
- Aerosol
 - Ventilation systems
 - Crop dusters and other ambient sprayers
 - Mail system

Probable Perpetrator

- Nation-state
- Dissident group acting for nation-state
- Independent religious or political group
- Individual or small group

Acquisition

- Until 18 months ago, instructions for the weaponization of several major agents were detailed on the internet
- Anthrax was available from 46 labs in many parts of the world

A Fertile Ground for New Microbial Agents

- Rapidly growing urban populations
 - 1800 2%
 - 1950 20%
 - 2010 67%
- Urban areas with a population
 - >7.5 million -- 1950 -- 2 cities
 - 2003 -- 30 cities
 - >15 million -- 2003 -- 7 cities

Transmitters of New Agents

- Hospitals
 - International travel
- Handwritten signature*

Recent enigmas

Were they natural occurrences?

- West Nile encephalitis – U.S.
- Foot and mouth disease
- H1N1 influenza
- Canine parvovirus
- Coronavirus

Solutions

- Better global knowledge of diseases
 - International surveillance
 - Intelligence
- Medical and public health preparedness
- Expanded research program for the infectious diseases
- Rapidly responsive biotech industry

- Man's only competitors for the dominion of the planet are the viruses – and the ultimate outcome is not foreordained.

Joshua Lederberg