

Nalgoria, Smith Weinstein

Special pleasure to be here at this symposium and I do thank you for inviting me.

Especially propitious time to review the question of the threat posed by smallpox and what we are or should be doing about it.

- Is pos. have elapsed since anthrax attacks -

still no idea who was responsible or what role foreign elements might have played

- No WMD in Iraq -

Appropriate time
• Pervasive view that a vaccination program is ill-founded, perhaps unnecessary
Why have we been concerned re. smallpox; has the threat disappeared; what of the future
I will endeavor to answer these questions



NEW JERSEY
MEDICAL SCHOOL

University of Medicine & Dentistry of New Jersey

HARVEY L. OZER, MD

Senior Associate Dean for Research

Office of the Dean

185 South Orange Avenue, MSB, Room C-671

PO Box 1709, Newark, NJ 07101-1709

Phone: 973-972-3558 • Fax: 973-972-7104

E-mail: ozerhl@umdnj.edu

Smallpox and the Threat of Bioterrorism

D.A. Henderson, MD, MPH

**Public Health Research Institute
Newark, New Jersey
November 3, 2003**

1

Biological Weapons

- A threat, largely ignored until 1995
 - Too difficult to grow organisms
 - A problem to disseminate
 - A moral barrier against use
 - So destructive as to be unthinkable

2

Biological weapons – 20th C.

- 1940-44 – Japanese Army – Unit 731
 - **Attacks on Chinese cities**
Anthrax, botulism, brucellosis, cholera, dysentery, gas gangrene, plague, paratyphoid, typhoid
- 1942-- ? Soviet use of Tularemia at Stalingrad
- Research and Development Programs in major countries, incl. US, UK, Australia, USSR

3

Biological weapons 1972 – A watershed year

- Biological Weapons Convention –1972
 - Countries pledged to destroy weapons and cease research on offensive weapons
 - Signed by US, UK, USSR, Iraq, et al
- Academia -- Medicine and Public Health
 - Activity of any sort re:biological or chemical weapons shunned
 - Little research on exotic diseases that are prime candidates for use

4

1995 Critical Events Iraq

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

5

1995 Critical Events Aum Shinrikyo (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 Congo to obtain Ebola virus
- Concern – **unknown, non-state sponsored organization, acting without concern for possible moral deterrents**

6

1995 Watershed Events

USSR

- 1972 - Bioweapons Program intensified
- 1989 – First knowledge of Program in West
- 1992 – Ken Alibek, Deputy Director of USSR Program, deserts to US
- 1992 – President Yeltsin admits that USSR has a program and that Sverdlovsk anthrax epidemic was due to a lab accident

7

"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

8

Russia and bioweapons

- Previous Bioweapons Program (50+ labs and 60,000+ persons) is reduced in scale. Less than half of the scientists are still employed.
- The major production lab for smallpox virus, at Sergiyev Posad, remains a secret facility
- Former Vice-Minister of Health Burgasov admits (2002) aerosolized smallpox was tested on Voz Island in 1971

9

Criterion Rating of Bioagents

Anatoliy Voroboyov –April 1994

■ Smallpox	26
■ Plague	23
■ Anthrax	21
■ Botulism	21
■ VEE	20
■ Q fever	20

10

Bio Agents of Greatest Concern

US Category A agents

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

11

Acquisition of Agents

- Naturally occurring pathogens
 - Anthrax, plague, tularemia, C. botulinum
- Diagnostic laboratories
 - In 2002, anthrax available from 46 labs
- Former Soviet bioweapons labs

12



Production of agents

- Until 2002, detailed instructions for production available on the internet
- Equipment – inexpensive, dual use
- Space required– minimal
- Size of staff required -- small

13



Methods for Dissemination

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

14



Policy decision Overall response

- Development of sustainable systems for dealing with catastrophic events of whatever cause
 - Biological – deliberate and natural
 - Nuclear –
 - Chemical
 - Explosives
 - Major accidents (e.g. plane and train)
- None of these problems are going to go away

15



Essential elements for response to a BW event - I

- Comprehensive plan including civil authority, public health, hospital, law enforcement, voluntary agencies, others
- Early detection and diagnosis
 - Emergency room personnel
 - Infectious disease specialists
 - Laboratory
- Vaccines, drugs, diagnostics

16



Essential elements for response to a BW event - II

- Communications network – 24/7
- National/state Surveillance Centers
- Training programs
 - Medical, public health
 - Civil authorities
 - Hospitals

17



Recent enigmas Were they natural occurrences?

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

18

A Fertile Ground for New Microbial Agents

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

19

Transmitters of New Agents

- International travel
- Hospitals
- An industrialized food supply

20

Longer-term Solutions

- Better global knowledge of diseases and possible terrorists
 - International surveillance
 - Intelligence
- Expanded research program for infectious diseases
- An international consensus and moral suasion.

21

Longer-term solutions

- New relationships and new mechanisms to facilitate industry, government and academia collaboration, especially under epidemic threat conditions to produce vaccines, anti-microbials and diagnostics
- Mechanisms for better international and intergovernmental cooperation

22

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

Joshua Lederberg

23