

Abstract of the Speech to the Faculty of Medicine

Threat of a Virus

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For the past 13 months, epidemics of a little known African virus, called Ebola, have been the focus of attention and concern world-wide. Nearly 20,000 cases have occurred; hundreds of physicians and nurses have perished. Death rates range between 50 and 80%. Fear of its spread across Africa and by plane to Europe and North America have resulted in elaborate air passenger screening and quarantine of recent visitors. For the three heavily affected countries – Liberia, Sierra Leone, and Guinea, it has proved to be an economic catastrophe. The epidemic is continuing. It was reported to WHO last March after 49 cases had occurred. It could and should have been stopped quickly. Complacency, both nationally and internationally, permitted a small fire to emerge as a raging forest fire. The epidemic is still not under control.

New vaccines, new therapeutics, and ever more sophisticated laboratories have bred a growing confidence that we should be able to deal expeditiously with new infectious diseases whatever they might be. But are we prepared?

Populations are growing and new metropolitan areas are emerging far more rapidly than the needed public health and sanitation facilities. World-wide travel is increasing exponentially. There is an ever growing potential for an unknown virus to emerge and to explode across the world in pandemic form. In Thailand, you experienced SARS; new strains of influenza virus are a concern even as we speak; a mysterious agent, MERS, has now appeared on the scene.

Right now, the weakest barrier in the ever-changing array of biological threats is public health – systems for timely reporting of diseases and their surveillance, sanitation and public health facilities that will deter spread of disease, preparedness programs that permit mobilization of community facilities to deal with epidemics—from community health workers to epidemiologists to laboratories to research and production units. International organizations to organize and to mount cooperative efforts are more essential than ever.

Ebola, SARS, MERS, influenza, and HIV have seriously taxed such inadequate public health resources as we have. Whenever I try to envisage what disasters a more serious organism might inflict, I can't forget that until 35 years ago, we had the smallpox virus, a disease which caused clinically serious illness in 10 million victims every year; 2 million died and many were left blind. It could spread in any climate at any time. It was finally defeated by a cooperative, deliberate public health effort involving all countries and drawing on the best of science and management. We are capable of doing far more than what we are now doing.

True success is not in the leading
before the application

BRAD. on - Sex 1980s
most serious of all pathogens in most people
1967 1st outbreak & outbreak, for 1/3 from
35000 yrs. ~~1967~~
can be very serious
7800 from 1967
FIVE !!
1-19

1/19/2015

The Threat of a Virus

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Infectious diseases – continuing threats

- In the 1950's, interest in the infectious diseases diminished as new antibiotics, vaccines, and treatment methods became available.
 - Tropical medicine was not well supported
 - Nobelist Macfarlane Burnett and others: 'infectious diseases are substantially conquered; major efforts should now begin to be diverted to the chronic diseases'
- Expanding populations and advances in virology brought new diseases: Lassa, monkeypox, Marburg, Rift Valley, Kyasanur Forest Disease
- HIV appeared on the scene (1982) – and others
 - Hendra, Nipah, SARS, MERS, dengue, new influenza strains
 - EBOLA (1976)

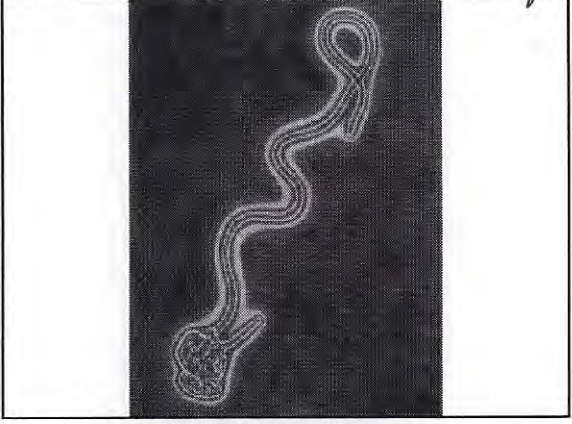
MY ROLE

(2001) ANTHRAX ① 6 agents for bioproducers
① Strengthen state + local - planning, communication (GARS)
epidemiology, labs, community organization

How significant is the Ebola epidemic?

December 2014

- "A colossus that continues to gather force"
Center for Strategic and International Studies
- "Spiraling out of control"
Dr. Tom Frieden, Director of CDC
- "Moving beyond our grasp"
Dr. David Navaro, UN Coordinator
- "The world is losing the battle to contain it"
Dr. Jeanne Liu, President MSF



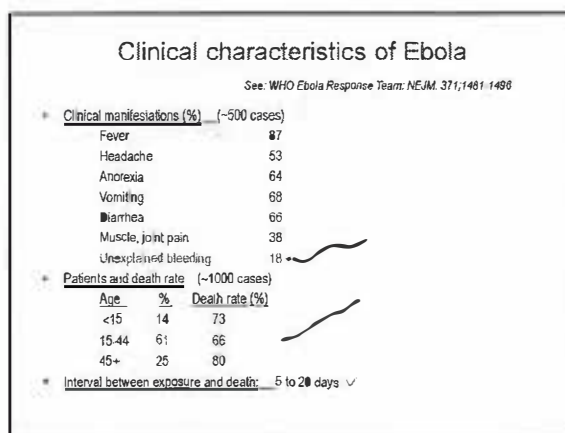
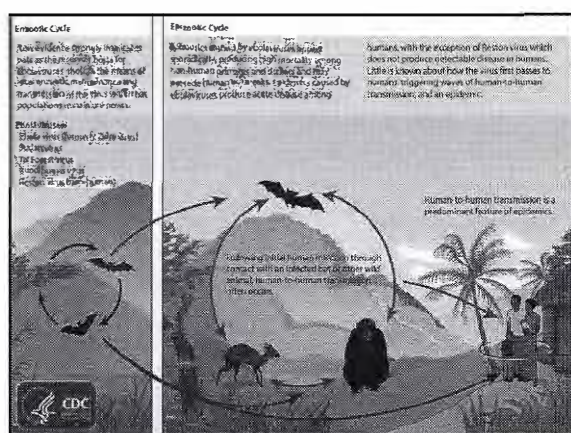
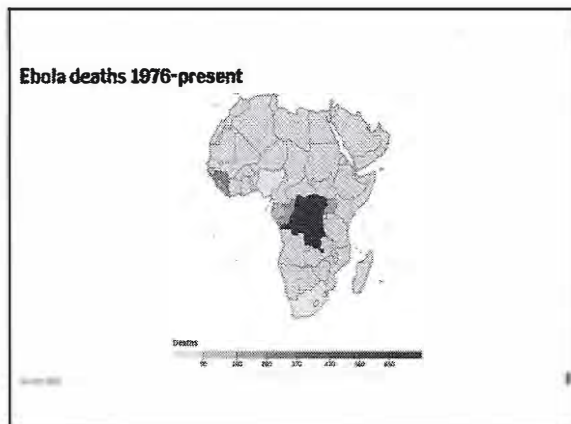
The Zaire Ebola epidemic--1976

- First case – Sept. 1: WHO organized team arrived Oct. 18
"Hemorrhagic fever epidemic: 11 of 17 hospital staff are dead"
280 cases in 55 of 550 rural villages (pop. 238,000)
Many cases due to contact in hospital (120 beds)
Only 20% of household contacts but rapid spread at funerals
- Measures taken
Isolation of ill patients in the hospital wards
Gowns and masks for hospital staff
Traditional burial practices strongly discouraged
- Last case on Nov. 9 (duration– 3 months)

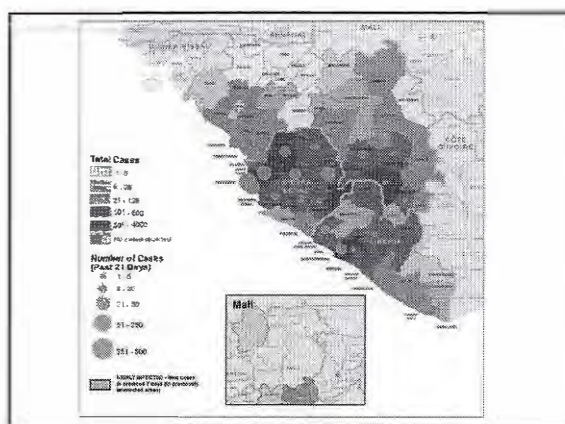
Ebola outbreaks-- 1976 to 2012

- Over the 36 year period, 17 outbreaks
- Size of outbreaks – 17 cases to 425 cases
- Countries involved -- all in central part of Africa
Primarily in Democratic Republic of the Congo (Zaire)
Also in bordering areas of Uganda, Sudan, Gabon
- Case-fatality rates: generally 50 to 75%
- Pattern of spread: household, burial practices, hospital
Note: No outbreaks in major urban area
All were stopped within weeks to a few months
- Small-scale laboratory research programs began

+ CARL JOHNSON
+ JUEL BREMAN
+ PETER POT



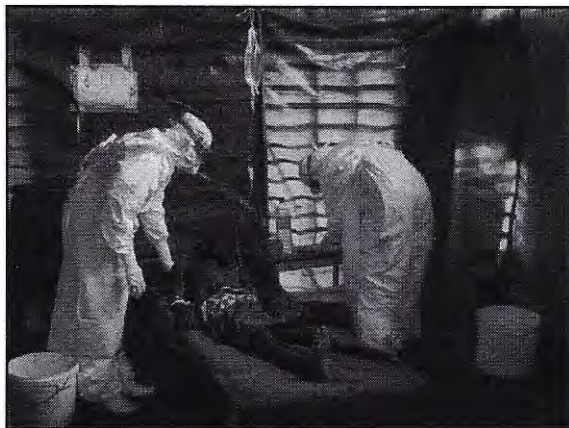
- ## Dimensions of the present epidemic
- * Began in Guinea – Dec. 2013: first reports to WHO – March 2014
 - * Cases and deaths (as of 17 January)
 - 21,171 cases; 8371 deaths (actual probably 2 to 4 times this)
 - Over 550 cases were health staff– more than half died
 - * Three countries account for almost all cases
 - Guinea, Liberia, Sierra Leone – 20 million people
 - Area is 85% as large as Thailand; 33% as many people
 - * Imported into Nigeria*, Mali*, Senegal, Spain, U.S., U.K.
 - *limited local spread of cases



Basic strategy for control

SPREAD OF VIRUS IS BY DIRECT CONTACT—not droplets

- * Isolate patients in a restricted treatment center or hut
 - Provide food and water
 - No visitors allowed
- * Persons who come into contact with patient to wear gown, mask, covering for head and feet
- * Dead bodies to be transferred in a sealed bag by special teams
- * Bodies to be deeply buried
- * Family and close contacts to be checked for next 21 days
 - (Attempts to isolate contacts for 21 days abandoned)



Challenges of gowns and masks

- Extreme shortages of equipment of all types
- Limited time for wearing because of heat (60-90 min.)
- Challenge of removing gowns and masks without skin or eye contact
- Decontamination of gear

Among other problems

- Patients feared hospitals – many resisted entry and sometimes fled
 - Health care staff were masked, wearing identical gowns
 - Visitors were not allowed
 - Patients fearful: not more than one in four would leave the hospital alive
 - Acute shortages of IV fluids, drugs of all types
- Recruitment of health staff (national and international) is difficult
- Traditional burial rituals are firmly embedded
 - May extend over many days and involve numerous friends and family
 - Customary practice is for participants to touch or stroke body

Ebola generated panic and fed a disaster

- Commercial impact
 - Most airlines suspended flights
 - Some shipping lines refused to dock
 - Business and tourist travel came to a standstill
- International restrictions
 - Screening of all travelers from the 3 countries for any suggestive symptoms; possible 21 day isolation and/or daily monitoring
 - Some countries applied these and other stipulations to some or all individuals intending to visit from various countries of Africa
- Economic and development impacts now foreseen to be catastrophic.

What of the future?

- Will Ebola spread throughout Africa? To other countries?
How soon will we have drugs for treatment?
What about vaccines?
- Are there other viruses which should concern us?

Lessons to be learned

- There will be other epidemic threats!
 - Increasing densities of population, more frequent and rapid travel, and closer contact with natural ecosystems dictate more viral diseases spreading more rapidly.
- Early detection, diagnosis, and rapid control are essential
 - Infectious disease expertise in major medical centers
 - Laboratories for diagnosis and research
 - Field epidemiologists to characterize and respond
- Public Health infrastructure for communication, public mobilization

An historical perspective

- One of the most feared of epidemic problems was smallpox in a densely populated city -- this was despite the fact that we had a good vaccine to protect contacts and to prevent its spread.
- Last year, the Ebola virus invaded, for the first time, three comparatively small cities -- Conakry, Monrovia, and Freetown. No one in the population had natural immunity and there was no protective vaccine available.
- The results were disastrous.