FUTURE DIRECTIONS FOR ONE HEALTH AND DISASTER MANAGEMENT/DISASTER RISK REDUCTION

OMAFRA

Emergency Management Research Expo 2015

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One Health Definition

One Health has been defined as "the collaborative effort of multiple disciplines — working locally, nationally, and globally — to attain optimal health for people, animals and the environment"

https://www.avma.org/KB/Resources/Reference/Pages/One-Health94.aspx
One Health Example—Antimicrobial Resistance

April 2015
The Public Health Agency of Canada announced that Health Canada’s Veterinary Drugs Directorate will introduce new federal regulations requiring veterinary oversight of antimicrobials to food animal by end of 2016
One Health History

The Greek physician Hippocrates (c. 460 BCE – c. 370 BCE) text "On Airs, Waters, and Place". Promoted the concept that public health depended on a clean environment.
Lucius Junis Moderatus Columella wrote a work *Segregation and Quarantine*, which was an early text on agriculture and lead to a basic form of One Health, in that it advised people and animals to be kept separate on farms.
“Between animal and human medicine there is no dividing line—nor should there be. The object is different but the experience obtained constitutes the basis of all medicine.”

Rudolph Carl Virchow
(1821 – 1902)
One Health History
People, Pathogens and Our Planet

Volume 1: Towards a One Health Approach for Controlling Zoonotic Diseases

Figure 2: Interacting Health Domains

- Ecosystem Services
- Humans
- Domestic Animals
- Wildlife
- Climate

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How the Fight Against Ebola Tested a Culture’s Traditions

To stop infected bodies from spreading the disease in Sierra Leone, health officials persuaded local leaders to change how villagers mourned.

Guinea’s Ministry of Health, indicated that 60% of cases in that country could be linked to traditional burial and funeral practices.

In their traditional Kissi culture, a woman buried with her fetus disturbs the world’s natural cycles—beginnings and endings among humans, animals, and plants.
Our response-

Health care workers in white Personal Protective Equipment (PPE)

"The problem was that the people handling the intervention only looked at this as a health issue; they did not try to understand the cultural aspects of the epidemic,"

Julienne Anoko WHO
“White Means Death”

Dr. MacGregor-Skinner
This is all One Health

Ecosystem Services

Humans

Domestic Animals

Wildlife

Climate

Narrow Broad

Sociosphere

One Health

World Bank- People, Pathogens and our Planet
One Health

Holistic One Health

The Peaceable Kingdom - Edward Hicks 1780-1849
ONE HEALTH AND RESILIENCE: A BIOLOGICAL MODELING FRAMEWORK

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Resilience

- the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events
Remember: All Disasters Are Local, Says FEMA Deputy Administrator

FEMA launches virtual think tank to solicit ideas for improving emergency management and response.

Elaine Pittman | November 14, 2011
Why Resilience?
Why Resilience?

An ounce of prevention is worth a pound of cure
2012- 552 natural and technical disasters (not including wars, conflict-related famines, diseases or epidemics)
- nearly 140 million people directly affected
- cost 157 billion USD

EM-CRED (Centre for Research on the Epidemiology of Disasters)
Resilience

Enhanced resilience allows better anticipation of disasters and better planning to reduce disaster losses—rather than waiting for an event to occur and paying for it afterward.
DISASTER RESILIENCE
An Integrated Approach

Defining Disaster Resilience:
A DFID Approach Paper
Resilience Characteristics

1. Governance
2. Risk Assessment
3. Knowledge and Education
4. Risk Management and Vulnerability Reduction
5. Disaster Preparedness and Response

John Twigg 2009
Resilience Dimensions

Community

INFRASTRUCTURAL  FAMILIAL SOCIAL
PERSONAL PSYCHOLOGICAL  ORGANIZATIONAL SYSTEMS
COMMERCIAL ECONOMIC
Resilience Characteristics
A Biological Model
Resilience Characteristics

• Unity of purpose
• Unity of effort
• Sensing capacity
• Multiple layers of defense
• Redundancy
• Ability to prioritize and reallocate resources

Gary Vroegindewey, DVM, MSS, DACVPM
Resilience Characteristics

- Self repairing
- Automatic response
- Hierarchical response
- Reserve capacity
- Agile learning Anticipatory capability
- Adaptability
Why aren’t we all dead?
Resilience Defense layers-structural

The Immune System’s basic parts:

1) Barrier protection (skin, mucosal lining of the lungs, gut, etc.)
2) Innate immunity
3) Adaptive immunity
4) Cellular immunity
5) Humoral immunity
Defense Layers - Procedural
Self Repairing

Anteroposterior View

A

B

C
Sensing
Automatic and Hierarchical Response
Redundancy/Excess Capacity
Agile, Analytical and Anticipatory
FUTURE needs Sensing

- Surveillance
- Social reporting
- Social media scanning
- Satellite imagery
- Unmanned Aerial Vehicles-Drones
- Rapid assessment teams
- Weather monitoring
- Remote sensors
FUTURE needs Agile Analytics

- Knowledge management system
- Resilience measurement
- Open source situational awareness dashboard
- Social network analysis
- Mapping GIS
- Big data analysis- Modeling
- Crowd sourcing
- Best practices
Situational Awareness Dashboard

Community Health Dashboard

Health Matters in San Francisco

http://www.sfhip.org
FUTURE DIRECTIONS IN DISASTER MANAGEMENT/DISASTER RISK REDUCTION
The Future

Prediction is very difficult, especially if it's about the future.
Niels Bohr
Intergovernmental Organizations

The Evening Star
OIE AND FAO CONFIRM ERADICATION OF THE VIRUS
10 REASONS NOT TO STORE THE VIRUS

OIE
World Organisation for Animal Health

FAO
Food and Agriculture Organization of the United Nations

World Health Organization
Our Government is committed to working with our partners to advance global efforts to detect, prevent and address emerging health security threats through the Global Health Security Agenda. We will continue to work with our international partners to prevent and respond to infectious disease outbreaks, like Ebola.

*Rona Ambrose, Minister of Health*
U.S. COMMITMENT TO THE GLOBAL HEALTH SECURITY AGENDA
TOWARD A WORLD SAFE & SECURE FROM INFECTIONOUS DISEASE THREATS

TODAY’S GLOBAL HEALTH SECURITY RISKS
- Emergence and spread of new microbes;
- Globalization of travel and trade;
- Rise of drug resistance; and
- Potential for accidental release, theft or illicit use.

The United States is strengthening Global Health Security, but no one country’s effort alone can achieve this goal. The strategy to achieve Global Health Security is rooted in science and global partnerships based on three widely accepted concepts and nine objectives.

Over the next five years the United States commits to working with at least 30 partner countries to advance model systems of Global Health Security, in the following specific areas:
Global Health Security Agenda:

In partnership with other nations, international organizations and public and private stakeholders, we seek to accelerate progress toward a world safe and secure from infectious disease threats and to promote global health security as an international security priority.
Four Global Health Security Risks

- 1. Emergence and spread of new microbes
Emerging Infectious Diseases

Emerging and Reemerging infections - 70% vector-borne or zoonotic

Map of world with various locations marked for different diseases.
Four Global Health Security Risks

2. Globalization of travel and trade
Four Global Health Security Risks

3. Rise of drug resistance

**Antibiotic-resistant infections**

- MRSA
- VRE
- FQRP

**New antibiotics approved by the US Food and Drug Administration**

Source: Centers for Disease Control and Prevention

Source: Infectious Diseases Society of America

RP - Fluoroquinolone-Resistant Pseudomonas Aeruginosa  VRE Vancomycin-resistant enterococci
Four Global Health Security Risks

4. Potential for accidental release, theft or intentional illicit use of biothreat agents
WORK WITH OTHER INTERNATIONAL ORGANIZATIONS

The WTO and the World Organization for Animal Health (OIE)

Collaboration between WTO and OIE concerns the use of international standards in the context of the SPS Agreement.
FAO Environmental and Social Standards relate to the following areas:

1. Natural Resource Management
2. Biodiversity, Ecosystems and Critical Habitats
3. Plant Genetic Resources for Food and Agriculture
4. Animal - Livestock and Aquatic - Genetic Resources for Food and Agriculture
FAO Environmental and Social Standards relate to the following areas:

5. Pest and Pesticide Management
6. Involuntary Resettlement and Displacement
7. Decent Work
8. Gender Equality
9. Indigenous Peoples and Cultural Heritage
Hyogo Framework for Action (HFA)

BUILDING THE RESILIENCE OF NATIONS AND COMMUNITIES TO DISASTERS
The HFA is a 10-year plan to make the world safer from natural hazards.
It was endorsed by the UN General Assembly in the Resolution A/RES/60/195 following the 2005 World Disaster Reduction Conference.

Download the full text of the HFA →
Download the summary chart of the HFA →
Download the HFA Mid-term Review →
"The more governments, UN agencies, organizations, businesses and civil society understand risk and vulnerability, the better equipped they will be to mitigate disasters when they strike and save more lives"

-- Ban Ki-moon, United Nations Secretary-General
Sendai Framework for Disaster Risk Reduction 2015-2030

The Four Priorities for Action

Priority 1. Understanding disaster risk
Priority 2. Strengthening disaster risk governance to manage disaster risk
Priority 3. Investing in disaster risk reduction for resilience
Priority 4. Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction
Discussion