# Civil Agency BioDefense Panel:

# A Look at Community Health Resilience

## Federal, State and Private Sector Perspectives

NDIA BioDefense Health Summit
October 21st, 2016

**Homeland Security**

# Civil Agency BioDefense Panel:

# Private Sector Perspective

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NDIA BioDefense Health Summit
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**Homeland Security**
U.S. DEPARTMENT OF HOMELAND SECURITY

# Health and Resilience

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HHS ASPR was created under the Pandemic and All Hazards Preparedness Act (PAHPA) in the wake of Katrina to lead the nation in preventing, preparing for, and responding to the adverse health effects of public health emergencies and disasters. Reauthorized in 2013 as PAHPRA. Web site: www.phe.gov
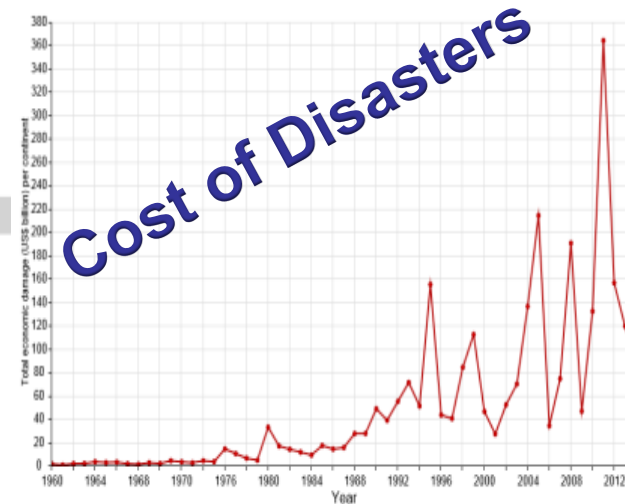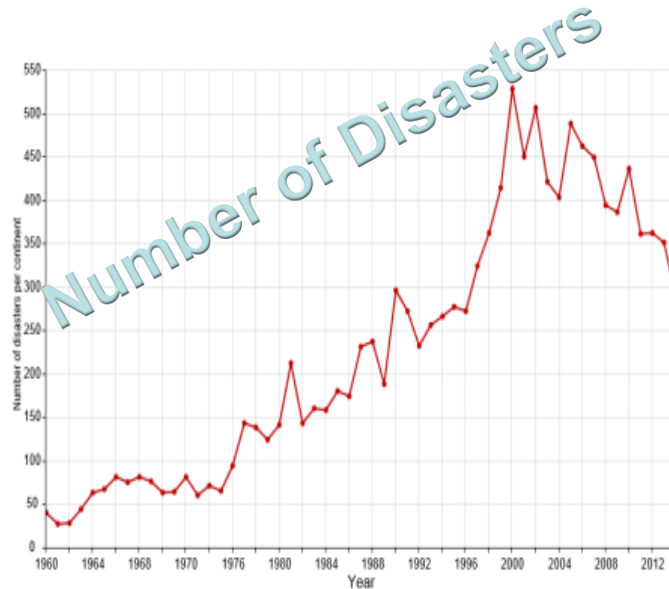


*ASPR: Resilient People. Healthy Communities. A Nation Prepared.*

# ASPR brings together Science, Policy, and Operations

# Sustainable Solutions Needed



*Number of Disasters*

*Cost of Disasters*

*EM-DAT International Disaster Database*

Our current preparedness, response, and recovery approach will have difficulty addressing the complexity, scope, and potential increase in new global threats over the longer-term.

# Global Threats

## Urbanization

## Climate Change

## Population

## Globalization

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# Resilience Is More Than Preparedness

**"Traditional" Preparedness:**
-Critical Infrastructure
-Response & Recovery Capabilities
-Individual Preparedness
-Hospital Preparedness
-Surge Capacity
-Continuity of Operations

**Resilience Adds Focus On:**
-Strengthening Everyday Systems
-Social Connectivity
-Behavioral Health
-At-Risk People as Assets
-Broader Community Partnerships
-Resilient Leadership
-Volunteerism/Empowered, Trained Citizens



*Adapted from Recovery Federal Interagency Operational Plan; FEMA 2014

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# What's "Health Resilience"?

*Resilience is a whole-community, multi-sector effort, so what's "Health Resilience"?*

*Human Health and Wellbeing is Foundational to Resilience*

**…almost everything we do in preparedness, response, and recovery aims to ultimately safeguard or promote human health and wellbeing.**

(Adapted from NPRSB Community Health Resilience recommendations, 2013)

http://www.phe.gov/Preparedness/legal/boards/nprsb/meetings/Documents/nbsb-chrreport.pdf

## Health Resilience Focuses on People

and the systems that safeguard their health and well-being.

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*Finding a "common vocabulary" is of far more practical importance than finding a common definition.*

*…that said, we do have a definition…*

**Community health resilience** is the ability of a community to use its assets to strengthen public health and healthcare systems and to improve the community's physical, behavioral, and social health to withstand, adapt to, and recover from adversity.
*National Health Security Strategy, 2015*

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# Community Health Resilience

*Involves **human** resilience (people) and healthcare **infrastructure** resilience*

**Robust everyday systems** (the pre-event status of health and social services in a community can predict resilience)

**Health, behavioral health, and wellness promotion** (physically and psychologically healthy people)

**Social connectedness/social capital** (has the potential to significantly reinforce resilience; public health, healthcare, behavioral health, and social services are important nodes of social capital in many communities)

**Culture of resilience** (informed, empowered people; neighbors trained to help neighbors during emergencies)
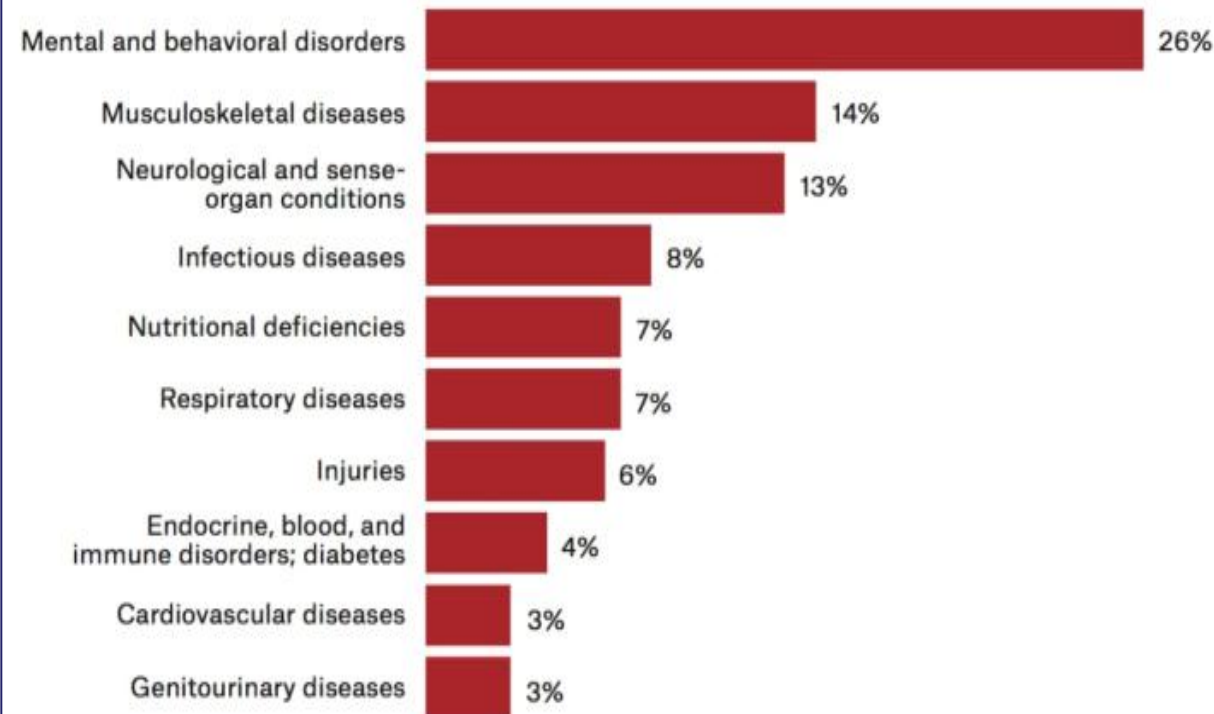
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"…cost to global economy $2.5T a year. "

"By 2030 the amount will increase to about $6T.."

*-Darkness Invisible; The Hidden Global Cost of Mental Illness, Insel, et al., Foreign Affairs Magazine, 2015*

**Losing It**

Top Ten Sources of Time Lost to Disability Globally From All Medical Causes, by Percentage

| Source | Percentage |
|---|---|
| Mental and behavioral disorders | 26% |
| Musculoskeletal diseases | 14% |
| Neurological and sense-organ conditions | 13% |
| Infectious diseases | 8% |
| Nutritional deficiencies | 7% |
| Respiratory diseases | 7% |
| Injuries | 6% |
| Endocrine, blood, and immune disorders; diabetes | 4% |
| Cardiovascular diseases | 3% |
| Genitourinary diseases | 3% |

SOURCE: World Health Organization, 2012.

# Behavioral Health and Public Health Threats

Zika May Increase Risk of Mental Illness, Researchers Say
*Global Health*

**Ebola Anxiety: A Bigger Threat Now Than the Virus Itself**
*HealthDay*

**How to Help Women Worried About Zika**
*Psychology Today*

Americans were more worried about Ebola than they are about Zika
*The Washington Post*

**Zika, and Zika anxiety, spreads to Miami Beach**
*CBS News*
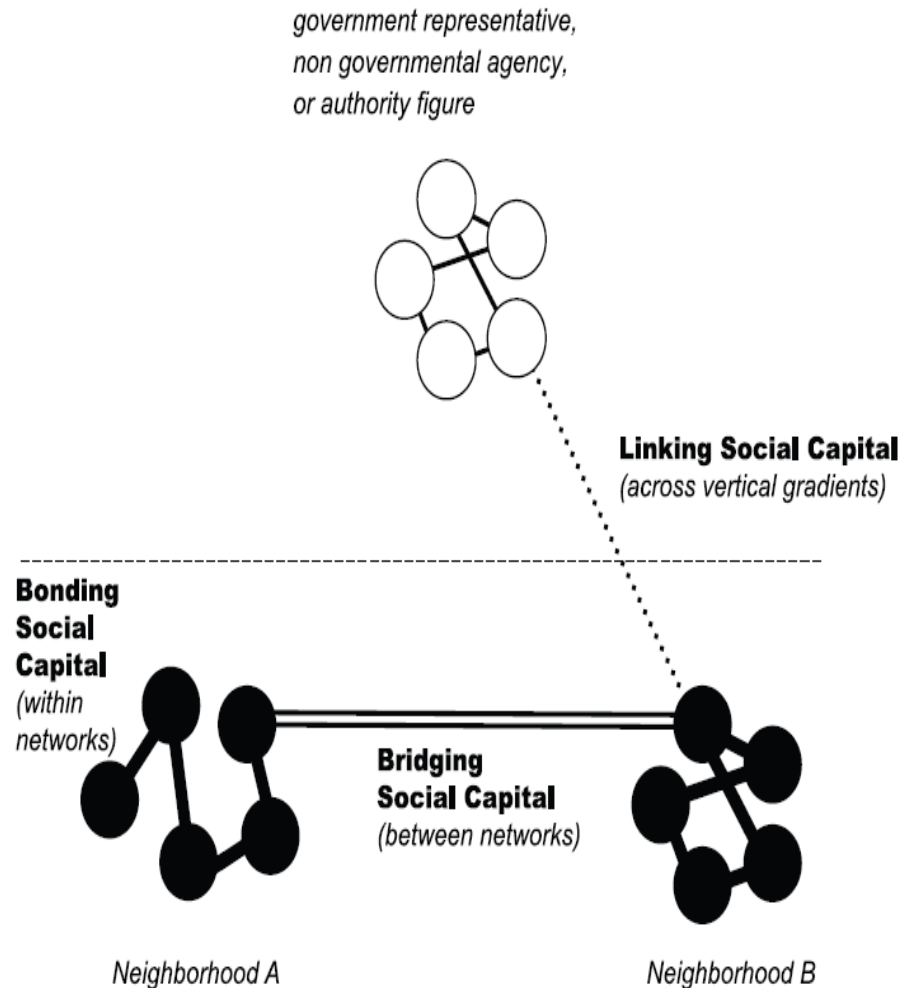
**An epidemic of fear and anxiety hits Americans amid Ebola outbreak**
*Washington Post*

# Social Capital

Social capital is a major predictor of recovery and may trump the degree of infrastructure damage, the underlying socioeconomic status of a community, and the amount of aid received by an area.
*-Aldrich DH 2010, 2012*

**Building social capital should be viewed as a legitimate, and perhaps essential, component of emergency preparedness.**

government representative, non governmental agency, or authority figure

**Linking Social Capital** (across vertical gradients)

**Bonding Social Capital** (within networks)

**Bridging Social Capital** (between networks)

Neighborhood A

Neighborhood B

# Resilience is Objective #1 in the U.S. National Health Security Strategy

## Build and Sustain Healthy, Resilient Communities

**1.1**
- Encourage **social connectedness** through multiple mechanisms to promote community health resilience and emergency response, and recovery.

**1.2**
- Enhance coordination of **health and human services** through partnerships and other sustained relationships.

**1.3**
- Build a **culture of resilience** by promoting physical, behavioral health, and social health… **neighbors trained and empowered to help neighbors**

**www.phe.gov/nhss**
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# http://www.phe.gov/abc

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# Key Resilience Resources

*U.S. HHS-ASPR Division of At-Risk Individuals, Behavioral Health, and Community Resilience*

*http://www.phe.gov/abc*

- **Community Resilience Factsheet:** http://www.phe.gov/Preparedness/planning/abc/Pages/community-resilience.aspx
- **Individual Resilience Factsheet:** http://www.phe.gov/Preparedness/planning/abc/Pages/individual-resilience.aspx
- **Responder Resilience Factsheet:** http://www.phe.gov/Preparedness/planning/abc/Pages/resilience-factsheet-responders.aspx

- **RAND Corporation**
  - **Community Resilience Web-page**
    Compiled information on resilience with a health focus, including a free, on-line course to assist communities to build resilience.   http://www.rand.org/topics/community-resilience.html
  - **Building Community Resilience to Disaster: A Way Forward to Enhance National Health Security**
    A report that examines the connection between national health security and resilience.
    http://www.rand.org/content/dam/rand/pubs/technical_reports/2011/RAND_TR915.pdf

- **Community Health Resilience Initiative**
    Sponsored by the U.S. Department of Homeland Security, this web-based collection includes a great number of resilience resources. http://communityhealthresilience.anl.gov/pls/apex/f?p=101:1

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# Civil Agency BioDefense Panel:

# DHS and Community Health Resilience

NDIA BioDefense Health Summit
October 21st, 2016

Jeffrey Stiefel, Ph.D.

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Office of Health Affairs

 Department of Homeland Security

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# BIOTERRORISM: Mother Nature or Man
## Which One Should We Be Most Concerned About

## Lets Compare Confirmed Bio Events since 1980 to Present

- **Manmade BioTerrorism Events (unclass)**

  - **1984 – Salmonella salad bar attack by the Bhagwan Shree Rajneesh Cult**

  - **1990 to 1995 – Botulinum toxin and B. *anthracis* attacks by Aum Shinrikyo in Toyoko**

  - **2001 – B. *anthracis* mail attacks in the US**

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# BIOTERRORISM: Mother Nature or Man
## Which One Should We Be Most Concerned About

- **Naturally Occurring Disease Outbreaks (not all inclusive)**

  - **<1980> - HIV/AIDS**

  - **1990's – Cholera in South America**

  - **1994 – Plague in Surat**

  - **2000 – Dengue Fever in Central America**

  - **2001 – Cholera in Nigeria and South America**

  - **2002 to 2003 – SARS in Asia**

  - **2003 – Plague in Algeria**

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# BIOTERRORISM: Mother Nature or Man
## Which One Should We Be Most Concerned About

**Weapons of Mass De-population**

- **Naturally Occurring Disease Outbreaks**

  - 2004 – Leishmaniasis In Afghanistan

  - 2004 – Ebola in Sudan

  - 2005 - Yellow Fever in Mali

  - 2005 - Dengue Fever in Singapore

  - 2006 -  Malaria in India

  - 2012 - to present -  Worldwide MERS

  - 2013 - to present – Ebola

Influenza A [Avian Flu] H5N1

Human Papilloma Virus [HPV]

Morgellens Syndrome

Deesillustration.com

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# Health Resilience Issues

- Three major gaps
  - Organizational roles and responsibilities not fully understood
  - The critical information requirements of most organizations are not understood by others (e.g., intelligence sharing)
  - Guidance needed to assist public health officials in translating information to protective actions

- State and local communities are not built alike

- Community survival depends on building resiliency through partnerships between government and private sector

**Emergency Support Function-8 (ESF-8) will not be fully realized until these gaps are addressed**

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# Mobilizing the "Whole Community"
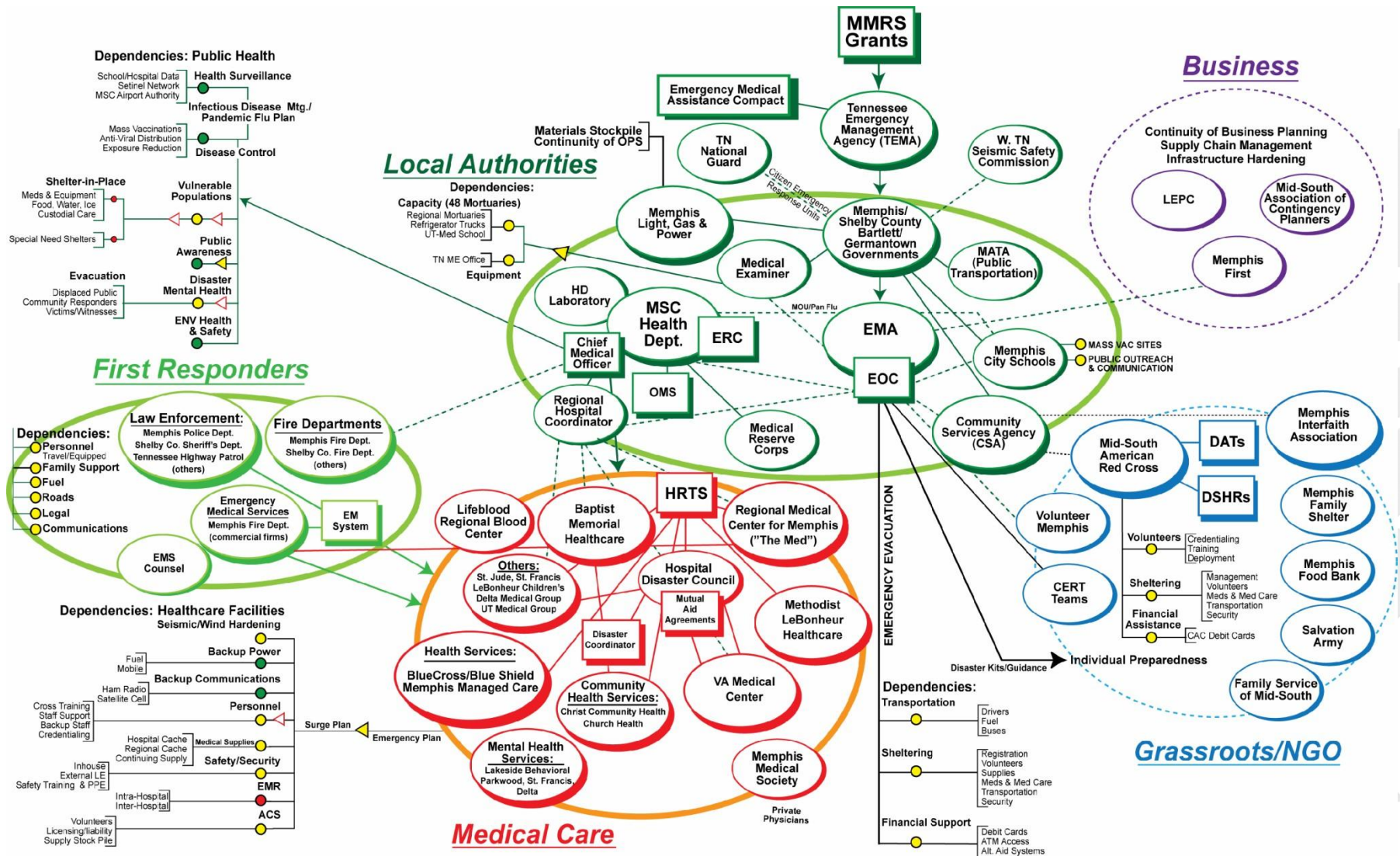


Figure 5, Taxonomy for Health Security: Memphis

# Vulnerable Populations

- Chronic medical conditions including mentally ill, clients with special needs
- Socially isolated
- Costal Communities
- Poor & vulnerable communities
- Subsistence Farmers
- Required medical treatments (Dialysis)
- Outdoor workers
- Very young children
- Elderly suffer the greatest effects of heat-waves (impact on mortality greater in women)

Ghaiath Hussein
MBBS, MHSc. (Bioethics)

# FACTORS CONTRIBUTING TO EMERGENCE OR RE-EMERGENCE OF INFECTIOUS DISEASES

**Evolution of pathogenic infectious** agents by which they may infect new hosts, produce toxins, or adapt by responding to changes in the host immunity.(e.g. influenza, HIV)

**Increased Antibiotic Resistant Bacteria** such as *Mycobacterium tuberculosis* and *Neisseria gonorrhoeae* to chemoprophylactic or chemotherapeutic medicines.

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# Mobilizing the "Whole Community"

**HEALTH** (Public Health, Mental Health, Physical Health)



Business Community

Infrastructure

NGO & Volunteers

Local Authorities

Schools/Academic Institutions

Neighborhoods

Federal Authorities

# The New Status Quo?
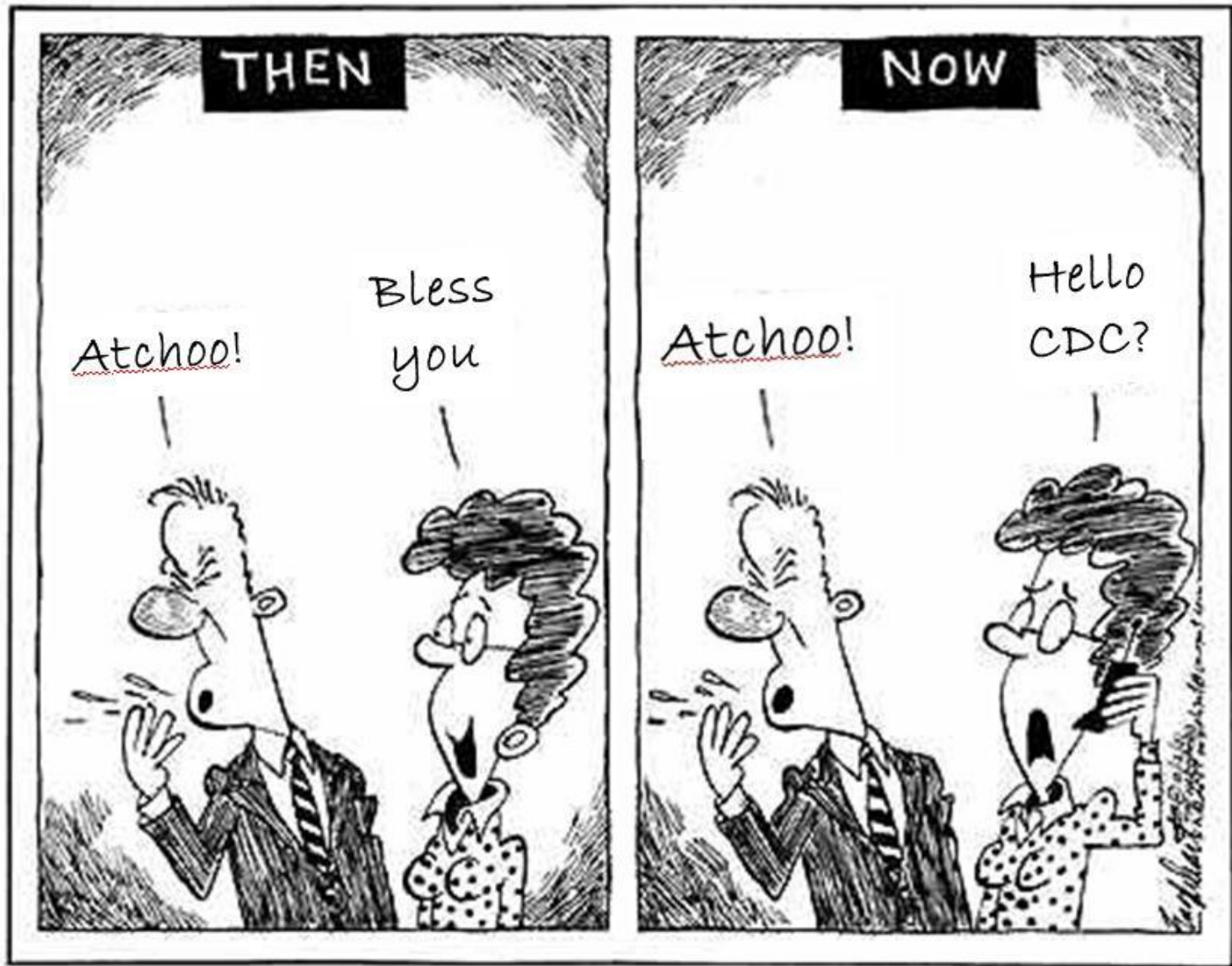
# Resilience Focus Areas
## Fundamental Intersections with Health



Regional Health & Hospital Resources

Financial Challenges

Public Health & Healthcare Plans, Resources, & Policy

Training, Exercises, & Education

Communications, Information Sharing, Health Data

Public Information & Media

**COMMUNITY BIO-EVENT RESILIENCE**

Critical Infrastructure Interdependencies, & Mitigation

Legal & Liability Issues

Business & Op Continuity, Supply Chain Mgmt

Human Factors, Community & Family

Response Challenges

Recovery & Long-Term Restoration

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# STRATEGIES

DEVELOPMENT OF PREDICTIVE MODELS BASED ON:

- Epidemiologic data

- Climate change surveillance

- Human behavior

ESTABLISH PRIORITIES

- The risk of disease

- The magnitude of disease burden

    - Morbidity/disability

    - Mortality

    - Economic

    - Cost

REDUCE POTENTIAL FOR RAPID SPREAD

DEVELOP CONTROL STRATEGIES

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Dr. KANUPRIYA CHATURVEDI

# POTENTIAL SOLUTIONS

- **Public health surveillance & response systems**
  - Surveillance at national, regional, global level

    - Epidemiological

    - Laboratory

    - Ecological

    - Anthropological

- **Rapidly detect unusual, unexpected, unexplained disease patterns**
  - Investigation and early control measures

- **Track & exchange information in real time**

- **Contain transmission swiftly & decisively**

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Dr. KANUPRIYA CHATURVEDI

# It's a Hard Problem Even When You Know What You're Looking For…

# Issue: Looking for Everything Means It's Harder to Find Any One Thing

# Where's Waldo? Emerging Infectious Disease
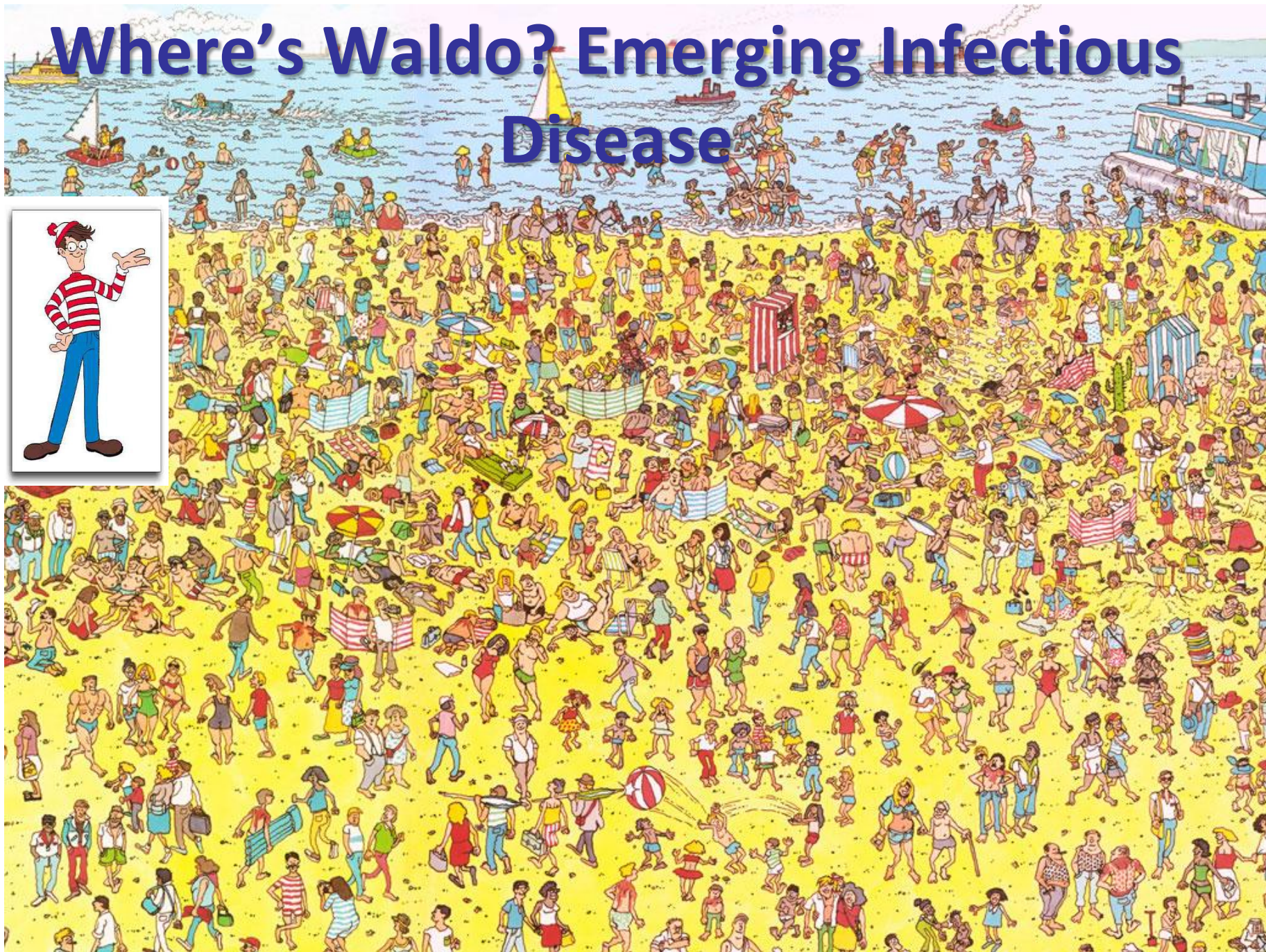
# ST JOHNS: DAMAGE TO EMERGENCY MEDICAL VEHICLES

Walter Hays, Global Alliance for Disaster Reduction, University of North Carolina, US

# Make Biosurveillance Systems "Tunable"

- Can't watch for everything, everywhere, all the time and still maintain a tolerable false positive error rate
  - Instead, design systems to be "tunable"

- One approach: set detection thresholds to make most likely events most detectable
  - As threats change, can change thresholds

# ESSENTIAL FACTORS FOR DISEASE ERADICATION IN COMMUNITIES

- Knowledge of its epidemiology and transmission patterns/mode

- Availability of effective tools for diagnosis, treatment and prevention

- Knowledge of local cultural and political characteristics

- Community acceptance and mobilization

- Political will and leadership

- Adequate and sustained funding

# Community Health Resilience Toolset:
## Guide and Toolkit

**The CHRI Guide and Toolkit provide users with a comprehensive overview of the many elements and characteristics of holistic community health resilience**

- **So what does it help with??**
    - As a planning template to develop or enhance public health and organizational preparedness, response, mitigation, and recovery/continuity plans
    - As a means to engage the broad stakeholder base toward community health resilience; to provide a high-level checklist of community health resilience capabilities
    - To learn about community health resilience best practices that public/private-sector and non-profit organizations have or are developing
    - To access policy and educational resources to provide information in specialty areas such as Geriatric/Elder and Pediatric/Children's disaster resilience issues
    - To help identify and point toward actions to improve community health resilience under steady-state conditions and during emergencies
    - To train and enhance strategic and operational needs and actions necessary for building health-resilient communities and organizations

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# Community Health Resilience Initiative
A National Initiative and Toolset

Document Search   |   Home   About Us   Contact Us   Add a Resource

**1. Search by keyword:**

**2. Enter optional filters:**

State ▾   Resource Type ▾   Hazard ▾   Mission Area ▾

Functional Capability ▾

**3. Search!**

Search   Clear

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## Ebola, Enterovirus and Emerging Infectious Disease Resources

US Climate Resilience Toolkit

Health Resilience Guidance

Draft Review

Web Version

Functional Capabilities

Mission Areas

Add a Resource

Enabling incident recovery in communities

### News/ blog entries

November 20, 2014 - The U.S. Climate Resilience Toolkit The U.S. Climate Resilience Toolkit provides scientific tools, information, and expertise to help people manage their climate-related risks and opportunities, and improve their resilience (read more...)

November 17, 2014 - Listen, Protect, Connect: Model and Teach A psychological first aid tool for teachers to help students bounce back from a disaster.

November 17, 2014 - Listen, Protect, and Connect: Psychological First Aid for Children and Parents A psychological first aid tool for children and parents to help children bounce back from a disaste (read more...)

November 10, 2014 - How to Talk to Your Children About Ebola Save the Children's emergency health experts have created tips for caregivers on how to educate chi (read more...)

November 10, 2014 - Ebola Virus Information for Maryland Residents The Maryland Department of Health and Mental Hygiene's Ebola website includes fact sheets, Q&As, guidance for health care workers and sch (read more...)

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### About the Initiative and this Toolset

The goal of the CHR Toolset is to provide practitioners and experts from all sectors, disciplines, and functional areas who have roles, responsibilities, or interests in CHR access to guidance and resources to make their community (or organization) more resilient. The CHR Toolset:

- Provides users a comprehensive overview of what CHR is—its many elements and characteristics—and what CHR requires.
- Provides guidance, information, resources, and best practices needed to enable and empower communities, organizations, and individuals to be health resilient through the Toolset's website.
- Provides a source of information on capabilities and solutions that public/private -sector and non-profit organizations have, or are developing, as well as other policy and educational resources to improve CHR under steady state conditions

### Community Health Resilience: A Description

Regardless of the event, a community's ability to successfully return to a "new normal" is based on its *resilience*, or its capacity to withstand, respond positively to, adapt, and recover expeditiously from a crisis or adversity.
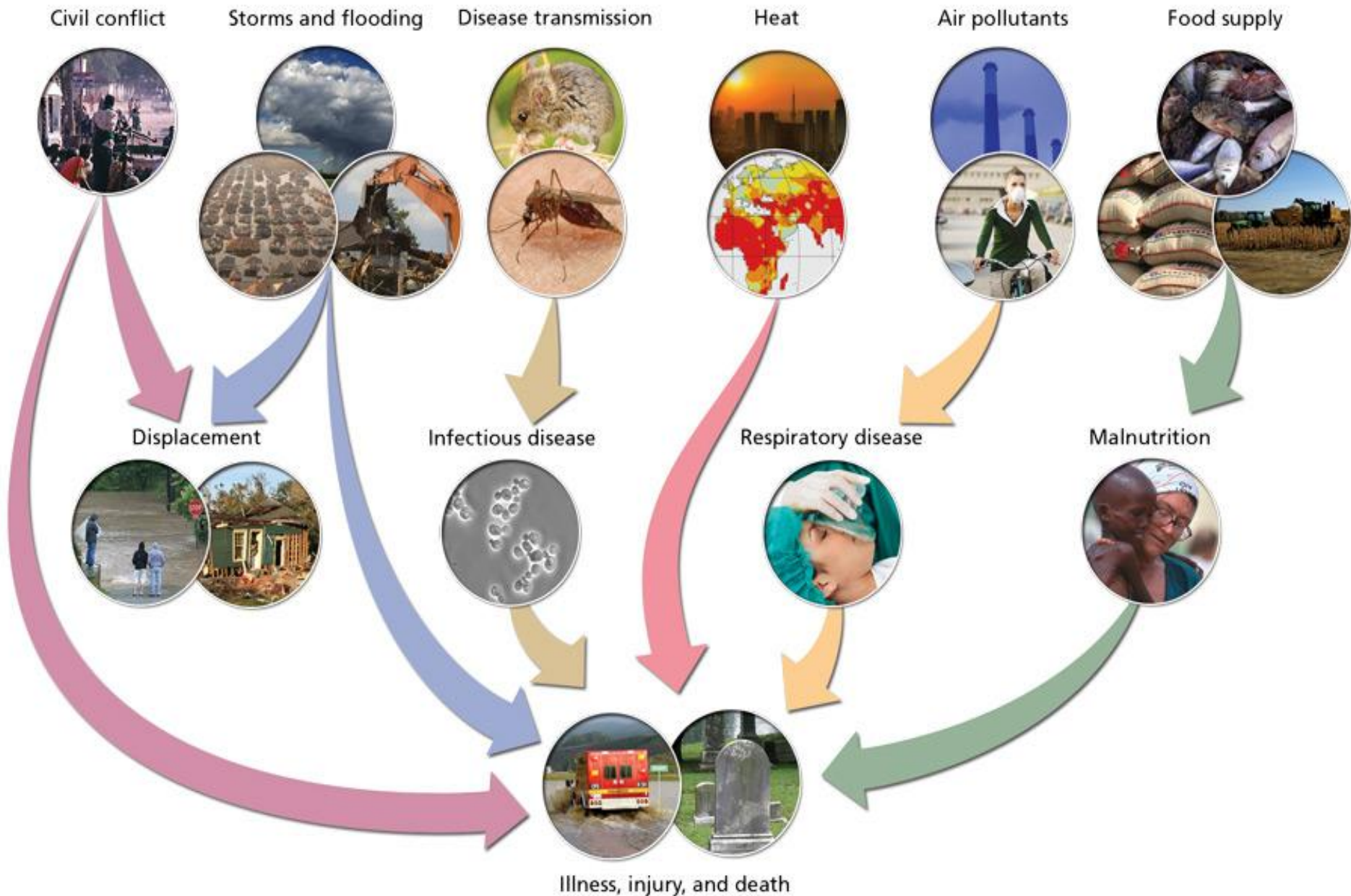
To date, there is no single-definition accepted for community resilience or CHR. In addition, the term *resilience* has different meanings depending on the professional function or discipline (e.g., sociologists, engineers, or emergency managers). Although there is no agreed definition, there are useful descriptions of both community resilience and CHR.

Useful descriptions include

*"The ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions, including deliberate attacks, accidents, or natural occurring threats and incidents."*

# Climate Change Influences on Health

Unresolved Issues and Difficulties:

Doomed to Failure

# COMMUNITY AND HEALTH RESILIENCY: A CONCEPTUAL FRAMEWORK

Why are we even discussing this?

# Defining Resiliency

# Community and Healthcare System Resiliency

An _emergent property_ of a system:

Things that create it

Situations that call for it

Outcome of an environment (how ever defined)

It _can not_ be isolated or measured before an adverse event / incident

"I will know it when I see or experience it"

# Community and Healthcare System Resiliency

"The development of _resistance_ (mitigation?) to any disruption within a "community" where there is the _ability to bounce back_ (recover) to its pre-disaster state and to build on _learning lessons_ of a crisis/disaster to gain _improved level of functioning and increased levels of  adaptability (resilience)._"

Al Romanosky

# Community and Health Resiliency: Doomed to Failure

# Community and Health Resiliency: Doomed to Failure

- Overcoming resistance to change
  - Repeating the same old stuff
  - It worked before it should work now
  - Why change a good thing?
- Failure to recognize evolving trends, threats and risks
- Failure to look to the future

# Community and Health Resiliency: Doomed to Failure

- Working within complex maladaptive systems
- Lack of consistent dependable resources including funding and leadership
  - Reduced sustainability
- Strict directives and confining guidelines and deliverables

# Functioning Within Complex Maladaptive Systems With *Self Organized Criticality* High Potential For Catastrophic Failures

# *Societal Interdependency* of Critical Infra-structure and Key Resources Essential for Community Resiliency
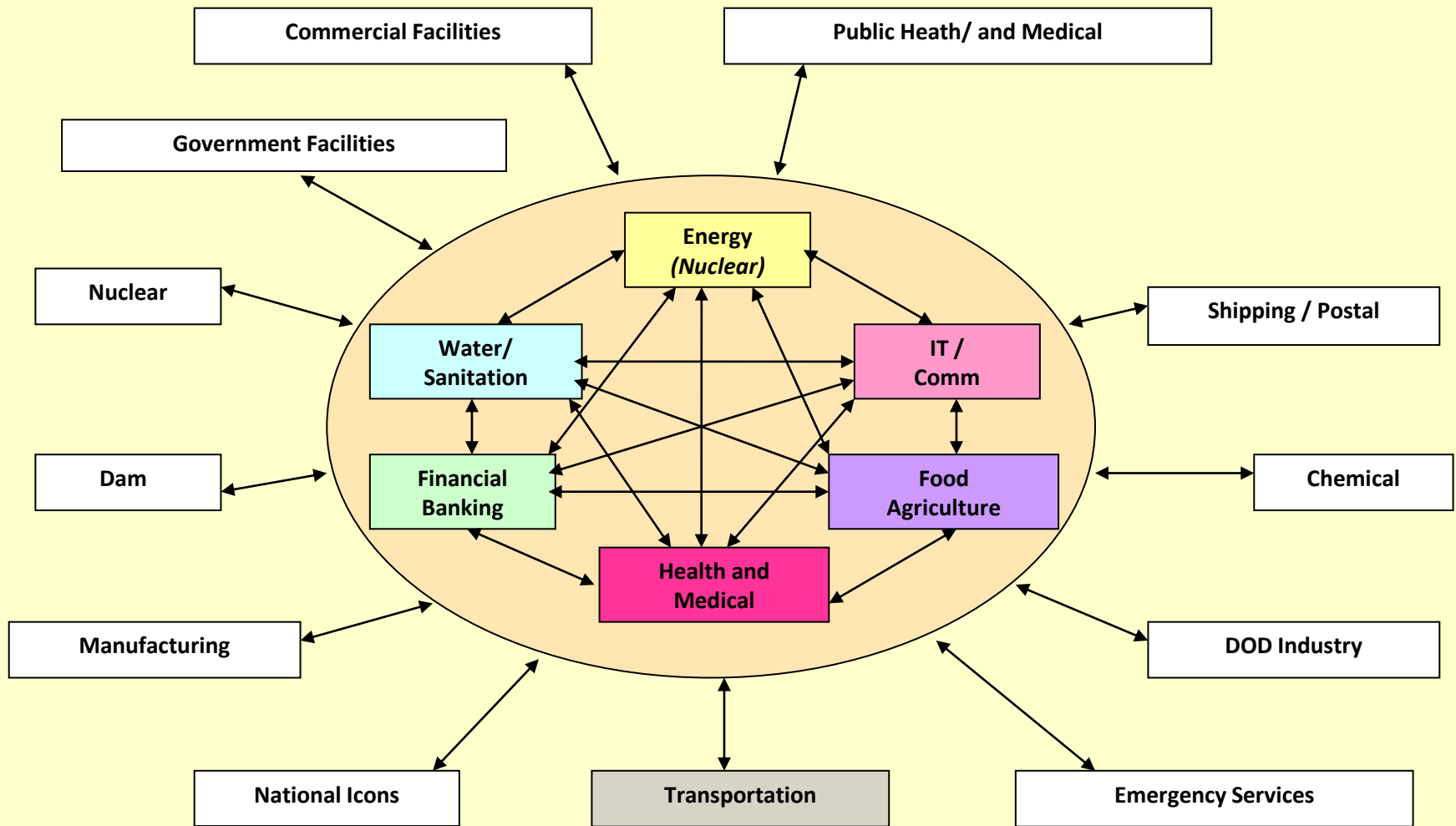
# Complexity of Community and Healthcare System Recovery and Resiliency

| Level | Complexity | Response |
|---|---|---|
| Individual | Simple / Focused | Life Safety, Water, Shelter And Food |
| Family | Simple / Focused / Complicated | Life Safety, Water, Shelter And Food |
| Facility | Complicated / Difficult / Limited Focus | Life Safety, Water, Shelter And Food *Continuity Of Operations* |
| Regional | Complicated / Difficult / Focused | Life Safety, Water, Shelter And Food / Continuity Of Operations / *Broad But Confined/ Interdependent Critical Systems* |
| State | Complex Adaptive System | Life Safety, Water, Shelter And Food / Continuity Of Operations / *Broad / Multiple Partners And Interests/ Interdependent Critical Systems* |
| Federal | Complex Adaptive (?) System | Life Safety, Water, Shelter And Food / Continuity Of Operations / *Broad / Multiple Partners And Interests/ Interdependent Critical Systems* |

Lack of consistent dependable resources including funding and leadership:

Reduced sustainability

# The State of Public Health

# The Public Health Emergency and Disaster Preparedness Funding



**Public Health Emergency Preparedness (PHEP) Cooperative Agreement Funding[1]**

Figures in millions

| Fiscal Year | Amount |
|---|---|
| 2001 & 2002 | $1000 |
| 2003 | $970 |
| 2004 | $850 |
| 2005 | $863 |
| 2006 | $1091 |
| 2007 | $897 |
| 2008 | $729 |
| 2009 | $689 |
| 2010 | $698 |
| 2011 | $614 |
| 2012 | $619 |
| 2013 | $585 |

Source: CDC, PHPR, Division of State and Local Readiness

[1] Totals include the following: PHEP Base Funding, Cities Readiness Initiative, Chemical Laboratory Capacity, Early Warning Infectious Disease Surveillance (EWIDS), Real-Time Disease Detection, Risk Funding, Smallpox, Pan Flu Supplement - Phase I, Pan Flu Supplement - Phase II, and Pan Flu Supplement - Phase III Funding. The FY2008 totals include $24 million for pandemic influenza preparedness projects that were from a different funding opportunity announcement.

**Ebola in the U.S.—Politics and Public Health Don't Mix;** By Judy Stone **Scientific American** October 6, 2014

# The Red Queen Theorem of Public Health Emergency Preparedness

"Well, in our country," said Alice, still panting a little, "you'd generally get to somewhere else -- if you run very fast for a long time, as we've been doing."
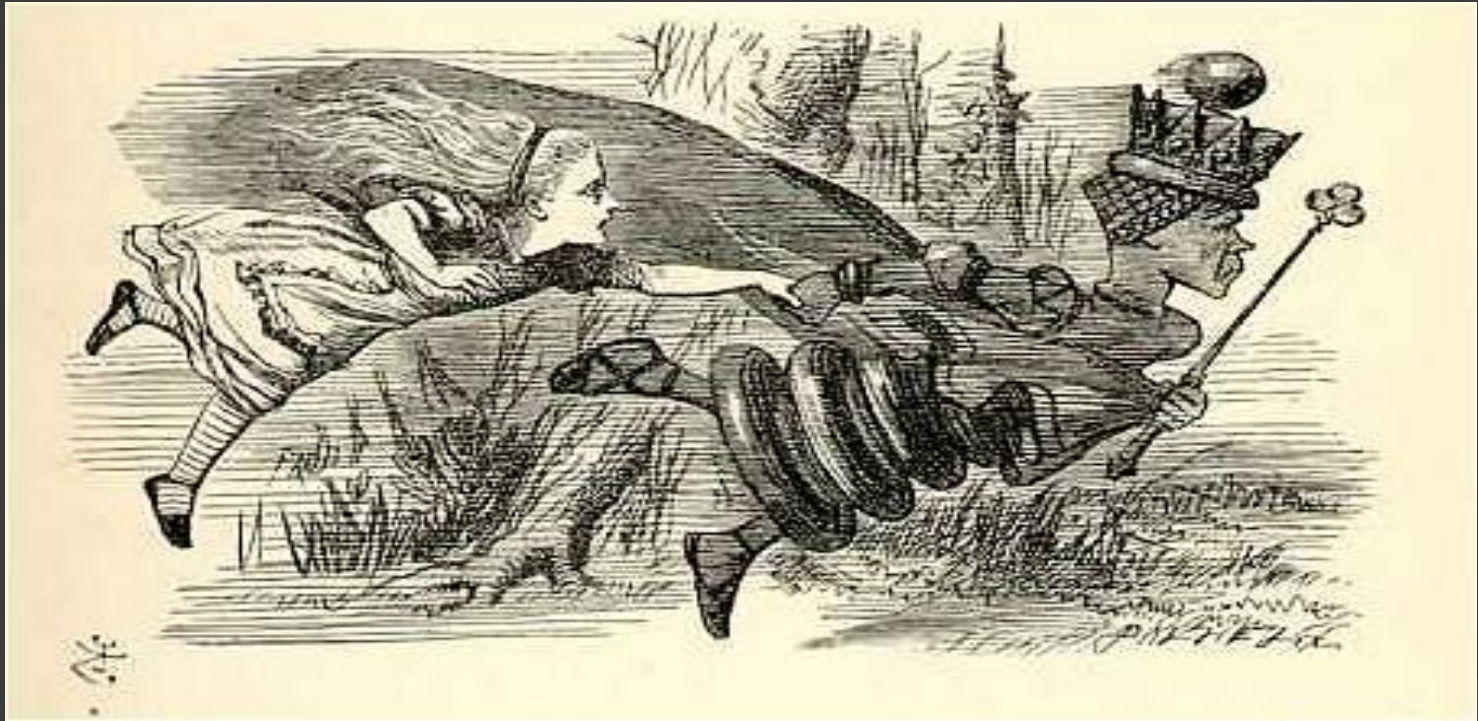


"A slow sort of country!" said the Queen.
"Now, here, you see, it takes all the running you can do, to keep in the same place.  If you want to get somewhere else, you must run at least twice as fast as that!"

Changing Systems / Dynamics

Short Term Narrow Perspective

Arrogance of Success

# Failure to Look to the Future

# The Conceptual Answer to Build Community and Health Resiliency

Take advantage of current events and relationships to build coalitions and bring about change

# Foster Innovation and Creativity as a Means to Upset and Change Existing Paradigms

# Building New Solutions

- Teach creativity
  - Accept failure
- Simplify, assess and re-align priorities
- Streamline national, state and local priorities
- Build new partnerships and nurture existing partnerships
- Motivate change
- Develop new concepts and paradigms to foster resiliency

# Building New Solutions

- Change from a categorical budget lines to a more "relaxed" general funding model

- Provide *consistent* funding for disaster and emergency preparedness mitigation and planning activities

  - Federal level Emergency Reserve Funds

Changes in Health Care Delivery
Re-align Priorities
Enhance and Build New Partnerships
Cybersecurity

# Recognize Changing and Evolving Threats

Pandemic Influenza

# Re-Align Priorities

Assistant Secretary of Defense

Bethesda National Naval Medical Center

# Enhance Existing Partnerships
# Build New Partnerships

Enterprise Green Communities

Building a Culture of Preparedness

Application of Services in New Paradigms

# Changing Directions and Adopting New Paradigms

# Summary