Health Sector Resilience for Natural Disasters and HCIDs

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Outline

• Who we are
• Health sector resilience for natural disasters
• Health sector resilience for HCIDs
• Future directions for disaster health resilience
• Clade X
Johns Hopkins Center for Health Security

We work to protect people from epidemics and disasters and build resilient communities through innovative scholarship, engagement, and research that strengthens the organizations, systems, policies, and programs essential to preventing and responding to public health crises.

Founded by DA Henderson at Johns Hopkins University
1998

2003-2016
Affiliated with University of Pittsburgh Medical Center

Joined Johns Hopkins Bloomberg School of Public Health
2017
Our Work: Priority Areas

- Emerging Infectious Disease
- Pandemic Flu
- Biosafety and Biosecurity
- Medical and Public Health Preparedness and Response
- Community Preparedness and Resilience
- Disease Surveillance
- Risk Communication
- Synthetic Biology
- Medicine, Vaccine, and Diagnostics Policy
- Science Diplomacy
- Nuclear and Major Disasters
State and Local Health Sector Resilience

• Two studies:
  • Natural disasters (Hurricane Sandy)
  • High consequence infectious diseases (Ebola)
  • Both funded by CDC
  • Similar qualitative mixed-methodology:
    • Lit reviews → key informant interviews → focus groups → expert working groups
    • For each we derived sector-specific checklists (e.g., PH, healthcare, EMS, elected leaders, public)

• Health sector = the entire spectrum of care givers and responders
• Resilience = the entire emergency management cycle
Some pertinent findings:

- Most patients: chronic conditions displaced from their normal health care.
- Vulnerable people rely on very fragile support systems.
- Disruption of outpatient, community-, and home-based care burdens hospitals that are ill-prepared these patients.
- Access to health care may be disrupted for extended periods → prolonged burdens on the facilities that remain open.
- Nonhospital facilities are usually less prepared and, therefore, inherently less resilient than hospitals.
Health Sector Resilience to Natural Disasters (cont)

• External support and relief are needed to handle the patient surge and to backfill local personnel who are unavailable.

• Unavailable fuel, electricity, communications, and transportation threaten people with chronic health needs and greatly hinder the ability of healthcare facilities to respond.

• Mobile health units can be very useful.

• Support from elected officials is essential to response efforts but conflicts between political leaders and ad hoc decisions that are inconsistent with plans can complicate the response.

Health Security Feb 2017
• Some key findings for hospitals:
  • Robust and resilient public health and healthcare foundation needed.
  • a single leader must be identified early in the response at each location and at each level.
  • Effective response depends on public trust: takes time, effective outreach and crisis communication
Health Sector Resilience to HCIDs (cont)

• Safely assessing and treating HCID patients requires extensive preparation and training: a tremendous burden.

• Treating HCID patients → extraordinary stress on HCWs

• Infection control considerations may limit the availability of some clinical services.

• Rapid identification and isolation at the first point of contact is essential
A Framework for Healthcare Disaster Resilience: A View to the Future
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- **Goals:** In the context of ongoing changes in the healthcare and public health landscape:
  - Investigate what a highly functional disaster health system would look like
  - Identify what practical, high-impact improvements/redesign of disaster health would be feasible in the coming decade with thoughtful shifts in policy.
Methods

• Reviewed the literature
•Talked to 44 key stakeholders, SMEs, and thought-leaders from diverse perspectives: individual interviews, 2 working group meetings, 2 conference calls and a focus group in Cedar Rapids Iowa
• Analysis of themes
• Preliminary external feedback
• Advisory group meeting
Think about Three Distinct Disasters

- Hurricane Sandy
- Boston Bombing
- Severe pandemic

- What’s similar and what's different in terms of healthcare needs/response?
- How well prepared are we for each?
4 Types of Disasters

- **Relatively small mass injury/illness events** (e.g., bus crash, tornado, multiple shootings, and local epidemics/small disease outbreaks).

- **Large scale natural disasters** (e.g., Hurricanes Sandy and Katrina, moderate earthquake, and large scale flooding)

- **Complex mass casualty events** (e.g., large scale shootings or bombing with many victims; mass casualty burn events, chemical; radiological, limited-scale bioterrorism; limited outbreaks of lethal and contagious infectious diseases such as Ebola or SARS)

- **Catastrophic health events** (e.g., nuclear detonation, large-scale bioterrorism, severe pandemic, or major earthquake)

  Differ with respect to characteristics and response requirements
Small Mass Injury/Illness Events
(bus crash, small epidemic, tornado)

Characteristics:

• Civil infrastructure (e.g., electricity, communications, water) is mostly intact
• Normal healthcare system is mostly intact (isolated damage possible, e.g., Joplin)
• Most response resources exist in the local area,

Response Requirements:

• Healthcare coalitions (HCCs) and their constituent members provide the structure and function required for small scale events. Tested many times in recent years
Large Scale Natural Disasters
(Hurricanes Sandy and Katrina, moderate earthquake, and large scale flooding)

Characteristics:
• Civil infrastructure is often damaged across a wide area,
• Healthcare facilities are damaged or degraded for long periods
• Vulnerable populations are at greatest risk,
• Much of the population is displaced from normal sources of health care,
• Most individuals seeking health care are patients displaced from normal sources of healthcare.

Response Requirements:
• Greater resilience of all aspects of the health sector as well as many other parts of civil society (transportation, utilities, and communication) is needed to prevent overwhelming hospitals
Complex Mass Casualty Events
(large scale shootings or bombing; mass casualty burn events, chemical; radiological, limited-scale bioterrorism; limited outbreaks such as Ebola or SARS)

Characteristics:

• The infrastructure and normal healthcare system are mostly intact

• Specialty care and/or special training is needed for large numbers of victims

Response Requirements:

• HCCs, trauma networks, and sophisticated EMS dispatching systems have enabled an impressive response to many recent events that are at the low end of the scale of this kind of event

• These events require highly specialized care that is only found in large academic medical centers. Most community hospitals would not be able to achieve and maintain the level of expertise and preparedness needed for this kind of patient care

• Need disaster centers of excellence among large medical centers connected to one or more local HCCs.
Catastrophic Health Event
(nuclear detonation, large-scale bioterrorism, severe pandemic, or major earthquake)

Characteristics:
- infrastructure may be damaged,
- the normal healthcare system may be degraded and therefore many people displaced from normal sources of care,
- vulnerable populations are at enhanced risk,
- many complex casualties can be anticipated,
- and the geographic extent of casualties likely covers a large area

Response Requirements:
- All of the efforts discussed above (building community resilience, HCCs, disaster hospitals) would be needed for optimal response to a catastrophic health event.
- What is lacking is a detailed national strategy and concept of how the many pieces would work together—how to enlist all national resources, public and private, as well as a well-developed system for crisis standards of care.
Build on What We Have

• There are functioning federal programs that are advancing healthcare and public health preparedness (e.g., HPP, PHEP, NDMS, MRC, etc.)
• State and local governments now have well-established preparedness programs
• Hospitals all have preparedness programs
• Many businesses have CoOP plans and programs
• There are numerous related volunteer and community organizations
• Although change may be warranted, it should be evolutionary and not revolutionary
Summary of Recommendations

1. Create a national network of regional *Disaster Resource Hospitals*
2. Launch a federal *Culture of Resilience* initiative to promote greater disaster resilience among community-based organizations at the grassroots
3. Strengthen support and fostering of *Healthcare Coalitions* with increased funding
4. Designate a program at ASPR exclusively dedicated to *catastrophic preparedness*
Establish a Network of Specialized Disaster Hospitals

• A network of geographically distributed disaster specialty centers (Disaster Resource Hospitals) in large academic medical centers.
  • Each closely connected to the local HCCs, MRCs and NDMS units
• Provide:
  • specialized care for complicated patients
  • Surge capacity and capabilities
  • Education and training to their local partners and coordinate exercises
  • Research test bed for best practices and innovation
  • A brain trust of expertise for each other and state and national governments.
• Advanced practice innovation including exploring ways for the formal healthcare system to interact more closely with civil society and community-based organizations
Enhance Community Disaster Health Resilience

• Encourage and incentivize all “ancillary” health entities and community-based organization to:
  • enhance their own resilience to disasters and that of their communities
  • engage with local HCCs around preparedness and resilience.
Catastrophic Preparedness

• Need to raise awareness and articulate a path forward:

• *Clade X*: Pandemic tabletop exercise: May 15, 2018, in Washington, DC

• Goal: Educate USG senior leaders about important preparedness policy issues that could be solved with sufficient political will and attention
• May 15, 2018, in Washington, DC
• Simulated a series of NSC meetings in response to a severe pandemic
• Conducted in front of live audience
• Livestreamed on Facebook
The Scenario

- Intentional release of engineered Nipah/parainfluenza hybrid virus by extremist group
- Moderately contagious; respiratory
- 10% fatal
- No effective medical countermeasures
- Leads to severe pandemic
Difficult Real-Life Challenges

• Inadequate global health security

• Lack of US capacity for isolation, transportation, and care of highly infectious patients

• Limited capacity for large-scale screening, monitoring, and quarantine of potentially exposed individuals
Difficult Real-Life Challenges

- Limited USG authority over federal system of public health and private healthcare system
- Competing interests of international relations, US foreign policy, military strategy, and health security
- Challenges in medical countermeasure development, manufacture, and dispensing in a crisis
Outcome

At 20 months:
- 150 million deaths
- 15 million in US
- Vaccine months away
- Health system and economy collapse
- Continuity of government threatened
1) Produce new MCM for novel pathogens within months not years.

2) A strong and sustainable global health security system.

3) A highly capable public health system that can manage the challenges of pandemic response.

4) Effectively harness all healthcare assets in a catastrophic pandemic.

5) An international strategy for addressing research that increases pandemic risks.

6) A national security community able to prevent, detect, and respond to infectious disease emergencies.

http://www.centerforhealthsecurity.org/cladex
Thank You

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