Disaster Duo:
Environmental Health and Community Psychosocial Health

Maureen Y. Lichtveld, MD, MPH
Professor and Chair
Department of Global Environmental Health Sciences
Tulane University
School of Public Health and Tropical Medicine

Different Types of Disasters

• Different types of disaster create different effects
  – Affected by type, scope, agent, timing
  – Natural (act of God)
  – Technological (Man-Made)

Technological Disasters

• Four factors that make them different
  – Duration of Impact
  – Unexpectedness
  – Absence of identifiable low point
  – Perception of control (Baum et al., 1983)

• Longer lasting effects
• Greater community dissension

What is a Community?

• Space and Boundaries -- Place
• Social Institutions -- Assets
• Social Interactions -- Coherence
• Social Control -- Values, Customs

Types of Trauma

• Individual trauma
• Community trauma -- “a blow to the basic tissue of social life” (Erikson, 1976)
  – Less visible, but more damaging
  – Protective factors, such as social support and resources-at-hand, can affect both perception and the capability to response
Variables affecting Risk Perception

- Controllable
- Known
- Equitable
- Voluntary
- Old risk

- Uncontrollable
- Unknown
- Inequitable
- Involuntary
- New risk

Most significant influence on development of stress is loss of control over event (Tucker, 1995)

CASE STUDIES:

WHAT IS OLD IS NEW AGAIN….

Sacramento Train Derailment

At night on July 14th, 1991: 97-car Southern Pacific train derailed in Northern California

19,000 gallons of pesticide metam sodium was leaked

“Pea green foam” and “noxious” smell started to develop in Sacramento River

Health Effects and Intervention

- Most were unaware of the spill until the morning, when almost 1,000 sought medical care for acute symptoms of toxicity
  - Headache
  - Eye irritation
  - Nausea
  - Diarrhea
  - Chest tightness
- Prisoners who helped in cleanup developed severe skin rashes

Mental Health Effects

- 4 months after the disaster, spill residents scored significantly higher on a battery of psycho-social tests (Hypochondria, Depression, Hysteria, Psychasthenia)
- Higher diastolic blood pressure – Higher cortisol levels than control group (Bowler, et al., 1994)
- Residents exposed were at a significantly greater risk for PTSD several years later
- Perception of exposure caused stress, independent of whether there was real exposure (Bowler, et al., 1998)

Agriculture Street Landfill

- Old city dump in New Orleans operated from 1909 to 1960s
- By 1951, over 250 tons of unregulated highly toxic waste was being deposited daily
- Low-income community developed on site in 1969
- 1990 Census identified 390 residential unites (~1,000 people) on the site, which is predominately (over 97%) African-American and middle-to-low income
Community health survey

- In 1986, average blood lead level of children living on site was 12.5 ug/dL.
- High levels of health complaints:
  - 40% Chest pains
  - 40% Dizziness
- This is “a community that suffers from an inordinate number of health complaints.”
- “There are obvious signs of severe mental stress related to the community crisis. Many residents appear to have reached a breaking point.”

Head Off Environmental Asthma in Louisiana

**Recruitment**
- Schools
- Social events

**Pre-Clinical Screening**
- Telephone Calls

**Clinical Screening**
- Assessment Baseline and 12 Months
- Health status information

**Environmental Assessment**
- Baseline, 6 mos, 12 mos
- Home “health”

**Genetic Study**
- Samples Banked

**AC/ Environmental Intervention**
- Just in case guidance

HEAL community defined

- **Place:** Flooding status is a delineation of “place” in the study superseding the traditional “neighborhood.”
- **Assets:** HEAL study participants are predominantly defined by the lack of core system assets: Health care, Housing, Homes of learning (schools)—the 3H’s benchmarking disaster recovery.
- **Coherence:** Faith-based, civic and other community organizations continue to play a pivotal role in post-Katrina New Orleans; a fertile foundation to build community resilience.
- **Values and Customs:** New Orleans is culturally endowed with a rich set of values and customs and a unique social control paradigm for sustainable community development.

HEAL Study Objectives

- **Characterize post Hurricane Katrina**
  - Environmental exposures to mold
  - Healthcare and social disruption
  - . . . and the impact on children with asthma
- **Evaluate effectiveness of an environmental and asthma counselor intervention**
- **Eligibility Criteria**
  - 4-12 years
  - Physician diagnosed moderate to severe asthma

Public Health assessment

- Former landfill with contaminants in soil, dust, air, garden produce; residents maybe exposed through ingestion, dermal contact and inhalation
- Fenced-in, undeveloped area a public health hazard; trespassing occurs frequently
- Residential area—no apparent public health hazard
- Moton elementary school—no public health hazard
- Blood lead levels of most children below levels of concern
- Community concerns: health problems, site clean-up, runoff of contaminants during flooding, maintenance of undeveloped area
- Recommendations: limit exposure; undeveloped area should not be zoned residential until contamination is reduced

Domains of Threat to the Health of Gulf-Coast Communities

Indicators of Health

The range of personal, social, economic, and environmental factors that influence health status are known as indicators or determinants of health.

Determinants of health fall under several broad categories:
- Policymaking
- Social factors
- Health services
- Individual behavior
- Biology and genetics

Figure 1.

Striking Disparities in Mental Health Care

- Minorities have less access to, and availability of, mental health services
- Minorities are less likely to receive needed mental health services
- Minorities in treatment often receive a poorer quality of mental health care
- Minorities are underrepresented in mental health research

Bridging Social Capital
- Social networks between heterogeneous groups

Community Resilience

Bonding Social Capital
- Social networks between homogenous groups of people

BUILDING BACK BETTER
A 12-Month Update on UNICEF’s Work to Rebuild Children’s Lives and Restore Hope since the Tsunami

FUTURE RESEARCH

“It is not acceptable for scientists to only inform and educate communities. We need to listen and learn from the community if we are to engage in more informed and more relevant research.”

Maureen Lichtveld, IOM. October 20, 2005
Susceptibility

- Underlying health conditions affect the degree of preparedness
  - In Gulf South:
    - Health disparities
    - Decades of Environmental Health Contamination
    - Persistent disaster-related adverse psychosocial consequence
  - A community’s ability to address areas of susceptibility reflects its vulnerability

Resilience

- Influenced by the 3-'H’s
  - Housing
  - Homes of learning (schools)
  - Health Care

- Access to and quality of these factors directly affects disaster recovery, and should be considered a predictor of community resilience

Possible Areas of Research

- Resilience
  - Promoting protective factors
  - Improving recovery

- What makes seemingly similar individuals/communities reach different mental health outcomes?

Community Susceptibility-Resilience Conceptual Framework

- Resilience and Susceptibility are two forces that determine the vulnerability of a community

- Susceptibility is a function of exposure

- Resilience is a function of response to that exposure (de Boer 2000)
• Community-based participatory research
• Target population of pregnant women and women of reproductive age living in SE Louisiana
  • Determine the effect of the DWH disaster on mental health
  • Determine pre- and post- DWH disaster attitudes related to environment and seafood
  • Build community resilience through embedding disaster interventionists

www.growhgulfsouth.com

Group exercise
• You have just been hired by Mayor Mundorf of Roosevelt City as a disaster health specialist
• After a recent flood from heavy rains, communities living near an old hazardous waste landfill have complained about headaches and skin rash.
• The community is VERY upset—despite multiple requests Mayor Mundorf has not taken any action
• The mayor asks you to develop three messages he can share at an upcoming community meeting; he is up for re-election…
• Use the 3x9 rule to develop your messages

United Nations Centre for Regional Development

“Community Based Disaster Management: Empowering Communities to Cope with Disaster Risks”