Response to Hurricanes Katrina and Rita

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Outline

• Introduction/Background
• Overview of the Situation
• Outcome & Roles
• Specific Experience
• Discussion
• Conclusion
Introduction/Background

History of natural disasters from the literature:

• 4 major hurricanes in Florida 2004
  – Almost half of people no evacuation plan
  – Importance of having access to food & water

• Cyclone in 2003 – 75% of water samples did not meet WHO standards for:
  – bacteria
  – chlorine residual
  – turbidity
History of Natural Disasters from the Literature:

- Earthquake in Iran 2005 – public health necessity of potable water, showers, and latrines
- Hurricane Floyd 2003 – increase in illnesses/injuries/suicide attempts; increased demand on medical and public health
- Thailand tsunami 2004 – 1,237 cases of acute diarrhea
Hurricanes Katrina & Rita

- Worst natural disaster U.S. history
- 75% of New Orleans flooded
- 1,100 lives lost in Louisiana
- Cost to date $75 billion

Wikipedia 2006
Population New Orleans

- August 2005: 485,000
- December 2005: 91,000
- March 2006: 155,000
- September 2008: 272,000

Population drop because 55% housing under 4 feet of water – total 75% housing flooded

RAND 2006
Environmental Contamination

- Arsenic, lead, organics, bacteria above EPA recommended screening limits
- EPA recommended people protect skin from contacting oil
- Wound infections (24 cases) resulted in 3 deaths

CDC 2005
Tuberculosis

- Louisiana rate high 4.9-7.0 cases per 100K
- West Virginia rate low 0.0-3.5 cases per 100K
- Concern about military exposure while flying patients from New Orleans to other areas/states
- Concern about close contact of military with contact with displaced persons

CDC 2006
CDC Injury and Illness Surveillance
September 8 – October 15, 2005

- Relief workers (military, paid civilians, self-employed or volunteer) (14% of events)
- Residents (34% events)
- Most of events unknown if relief worker or resident
- Gastrointestinal infection events were not common
CDC Injury and Illness Surveillance

- Skin rash illness and respiratory infections disease clusters
- Acute respiratory infections increased
- Skin & wound infections decreased
- Heat-related injuries decreased
Number of National Guardsmen Mobilized to Gulf Coast

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Number</th>
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<tbody>
<tr>
<td>August 26</td>
<td>Prior to Hurricanes</td>
<td>2,000</td>
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<tr>
<td>August 29</td>
<td>Hurricane Katrina land fall</td>
<td>5,000</td>
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<tr>
<td>August 31</td>
<td>Levees break in New Orleans</td>
<td>11,000</td>
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<td>September 1-5</td>
<td>Unaffected States</td>
<td>30,000</td>
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<tr>
<td>September 10</td>
<td>Peak</td>
<td>50,087</td>
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<tr>
<td>September 24</td>
<td>Hurricane Rita – many evacuated</td>
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*National Guard, October 2005*
National Guard Response

- National Guard rescued 17,400 people
- Air National Guard evacuated over 70,000 people

National Guard, February 2006
Task Force West Virginia Hurricane Katrina Relief

NAS New Orleans Sept. 11, 2005
WV National Guard Response

- WV Air National Guard evacuated patients from New Orleans to Camp Dawson, WV
- Contingent of West Virginia Air & Army National Guard volunteers traveled to New Orleans by convoy
  (September 2-30, 2005)
- Total WV response over duration 1,200
Convoy

- 62 military vehicles traveled from Charleston to New Orleans

- 120 WV Army and Air National Guard volunteers
Military Services at Belle Chasse Naval Air Station Joint Reserve Base

- Coast Guard
- Navy
- Marines
- Air Force Reserve
- Air National Guard
- Army National Guard
Disaster

Hurricanes Katrina and Rita destroyed infrastructure:

- Limited police
- No potable water
- Buildings standing in water
- No food – restaurants and stores closed
- Many hospitals closed
- Sanitarians evacuated
Expeditionary Medical Support (EMEDS)

What does an EMEDS provide in war/disaster?

• An EMEDS + 25 serves 3000 – 5000 personnel, depending on the size

• Arrives in expandable modules
Task Force West Virginia
Hurricane Katrina Relief

NAS New Orleans  Sept 12, 2005
EMEDS – Provides

- Primary care
- Emergency room
- Patient wards for patient holding
- Mental health
- Supply
- Medical command and control
- X-ray
- Laboratory services
- Bioenvironmental engineering
- Public health
EMEDS

Author was Chief, Public Health Officer

• Involved in 3 EMEDS rotations
  - Texas
  - Massachusetts, West Virginia
  - Oklahoma

• Additional EMEDS + 25 present in Mississippi
  - taxing to National Guard involved in ongoing Southwest Asia rotations
Public Health (PH)

- Consists of Public Health Officers and Technicians
- Focus on troop health protection
- Past wars 80% of hospital admissions due to disease and non-battle injuries
- All branches of U.S. military have preventive medicine staff to reduce these losses
Public Health

How does PH prevent illnesses?

• Food inspections
• Water treatment and testing
• Insect surveillance and spraying
• Rodent control
• Air monitoring for carbon monoxide and other chemicals
• Non-ionizing radiation surveys
Public Health

• Goal – help protect National Guard troops from disease, heat stress, chemicals, radiation, and other health hazards

• Objectives – set up a public health/preventive medicine network among the Navy, Army National Guard, and Air National Guard to provide:
  – best use of resources to educate troops
  – protection from disease
Outcome & Roles

• Chief, Public Health for September 2005
• Responsibilities:
  – Collect & summarized daily EMEDS patient logs
    • check for clusters or trends of illnesses
    • disbursed data to many organizations including CDC
  – Conduct Belle Chasse NAS and field assessment for hazards
Responsibilities:

• Assessment for hazards included inspections of:
  - environmental hazards (chemical, biological, physical - heat, noise, radiation)
  - food
  - water
  - troop housing
  - waste disposal
Specific Experience

• Worked with USS Iowa Jima sick bay – accurate recording of illnesses/injuries

• Worked with Navy preventive medicine from Norfolk, VA and the permanently assigned sailors at Belle Chasse NAS following their return after evacuation
Public Health (PH) Mission – Prevent Illness

• Trained civilians in heat stress and insect threat
• Trapped mosquitoes in light traps as a part of surveillance
• US Air Force Reserve and Navy entomologists – based on surveillance sprayed for mosquitoes and flies throughout New Orleans
Insects

• PH worked with Navy preventive medicine to treat fire ant problem in tents and some buildings
• Flies and maggots a problem because of sanitation
• Scabies outbreak with Wisconsin Army National Guard
• Chiggers – grass
• Large spiders + poisonous black widows and brown recluse spiders

Army Times 2005
U.S. Navy EPMU

- Navy Environmental Preventive Medicine Unit (EPMU) out of Norfolk, VA to work with food and water at New Orleans Navy bases – including Algiers & Belle Chasse
  - Included an entomologist, industrial hygienist, microbiologist, and occupational physician capabilities – lots of equipment
  - Tested water at Navy bases, conducted insect monitoring, provided lab support for EMEDS and the Navy clinic at Belle Chasse NAS
Food

PH inspected food service and billeting Belle Chasse NAS and greater New Orleans area:

• Navy
• Army National Guard
• Air National Guard
• Civilian contractors
• Contacted Marines
Food

- Meals, Ready to Eat (MRE) used for the first 2 weeks
- MREs were supplemented at Belle Chasse with hot meals from the Navy galley once potable water was available
- Other National Guard locations used mobile kitchen trailers and sealed rations – heated by hot water – fairly safe
- Fresh fruit available after 1st week
Water

- Bottled water was used for drinking – civilians and military
- Water trailers for showers, decontamination, hand washing
- PH did water testing on base, in schools and other buildings where soldiers billeted
- Navy provided capabilities for organic and metal water testing
TRUCKS USE RIGHT LANE
MAINTAIN SPEED
Water

- Some of PH & bioenvironmental spent a significant amount of time testing water trailers
- Belle Chasse NAS was a staging area, water trailers were filled there and taken with troops throughout area of operation
- PH monitored water on base – it was primarily a Navy responsibility – base preventive medicine staff had been evacuated
Water

• The Army National Guard had 4 Reverse Osmosis Water Purification Units (ROWPU) in the New Orleans area

• Preventive medicine required to test the water (raw and treated) when ROWPU moved to a new source or flushed the filters

• Conducted chemical and bacteriological analysis of water
Disaster – Threats to Public Health

- Water damage and mold growth
- Insects
- Disease
- Spiders, bees, poisonous snakes
- Water contamination
- Waste disposal
- Food borne illness
- Stray animals
- Rodents
Surveillance of Illnesses/Injuries

- Surveillance of illnesses treated in EMEDS
  - Provided info to CDC, National Guard Bureau, Air Force
  - Provided injury info to Army Safety Officer
- From Sept 4 – Oct 2 EMEDS 1255 patient visits, mostly military – some civilian
- Provided immunizations to military and civilians
Top 8 reasons for EMEDS visits

1. Medical/surgical (23%)
2. Respiratory complaints (19%)
3. Dermatologic (16%)
4. Work related injuries (14%)
5. Injury/other (5%)
6. Heat injuries (3%)
7. Gastrointestinal infections (3%)
8. Eye problems (3%)
Skin rash illness

- Many treated in the EMEDS for an unusual rash – investigated
- First theory is due to guardsmen being in the putrid water conducting search and rescue
- Infection control flight physician suspects a viral infection
- Detailed workup of many cases conducted by Navy on the USS Iwo Jima
Pneumonia Outbreak Army National Guard

- Index case at Belle Chasse
- Unit moved to a distant correctional facility (Pearl River, LA)
- Flew in to Pearl River with flight physician, nurse practitioner, epidemiologist, public health
- 22 ill – close living quarters and stressful hours and conditions
  - Boat patrols
  - Only one case confirmed pneumonia – 7 potential cases
  - Recommendations included improved ventilation, less crowding, hygiene & cleaning
Hazardous Materials Inspection
Army Aviation Support Facility

- Flood water from Lake Pontchartrain during hurricane damaged facilities
- Downed power lines
- Chemical contamination
- Potential asbestos exposure
- Unsecured compressed gas cylinders
Inspection of Buildings for Mold

• PH guidance requested in cleanup of a school & other buildings involving fiberglass and mold damage
• Recommendations made for personal protective equipment types
• Recommended stay out of certain building because mold so extensive
Living Conditions

Site selection is important

• Number of military Belle Chasse NAS surged to 25,000 almost overnight + civilians
  – Hazards such as fiberglass everywhere from hurricane damage

• St. Barnard’s Parrish
  – Extensive flooding in the area
  – Colorado Army National Guard – Murphy Oil, hazardous waste incinerator, meat storage warehouse

Harrell 2005
Showers
Convention Center

- Convention Center – New Orleans residents and visitors sought refuge from hurricane and flooding
- International and domestic passengers stranded due to flight cancellations
- Flies and maggots
- Rats/animals at Convention Center
- Trash everywhere inside and out – civilian contractors clean up took weeks
Convention Center

• After civilians moved out – military moved in:
  – Puerto Rico & Missouri National Guard
  – Active duty Army hospital
• PH inspected – food quality was generally good – military and contractors
  – Provided portable showers
  – Problems getting portable toilets cleaned and dumpsters emptied
Discussion

- There was a great deal of activity in New Orleans, large number troops & recovery workers rotating in and out
- Author asked to stay as Chief Public Health Officer to provide continuity
- For illnesses reporting, difficult to get denominator data
- Worked to improve consistency of illness reporting
Discussion

• When surveillance clusters were identified – used whatever personnel and transportation available to investigate
  – conducted interventions
• Cooperation among branches of service was good
• Next time
  – Bring own military vehicle
  – Bring own equipment
Conclusion

• In the face of a collapse of infrastructure, the National Guard can assist with restoration of order, search and rescue, and cleanup operations without significant disease outbreak

• This is accomplished through preventive medicine and public health measures to protect troops
Acknowledgments

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