Community Health Safety & Disaster Preparedness, Response, and Recovery

PHC 6102
Principles of Health Policy and Management

Objectives

• Explain public health approach of ensuring community health safety
• Describe the elements of the disaster management cycle, including preparedness
• Understand public health disaster response and escalation
• Describe public health’s role in disaster examples

Public Health Approach to Community Health Safety

• National
  – Improving and expanding health information and data systems
  – Effectively transition research into practice
  – Provide funding and other resources
  – Identify connections
• State
  – Develop a statewide agenda
  – Prevention-focused training, technical assistance, and financial support for local community efforts
  – Identifying new funding streams
• Local
  – Build coalitions and partnerships
  – Enhance public awareness
  – Link to and support the medical community’s clinical response role
  – Conduct surveillance

Multi-level Approach to Community Health Safety

Disasters

• An event concentrated in time and space that causes significant physical and social impacts
• Example: An earthquake with 50 deaths in a matter of minutes vs. automobile fatalities with about 40,000/year in the U.S. (Lindell, 2011)
• Natural disasters
  – Floods, Earthquakes, Hurricanes
• Man-made disasters
  – Fires, chemical spills and explosions, and airplane crashes

Disaster Management Cycle

• Prevention/mitigation (pre-impact)
• Planning/preparedness (pre-impact)
• Response and epidemiologic activities (impact)
• Recovery (post-impact)
**Disaster Prevention / Mitigation**

- Measures taken to reduce the harmful effects of a disaster by attempting to limit impacts on human health and economic infrastructure
- Levels of strategies:
  - Primary
  - Secondary
  - Tertiary

**Disaster Preparedness**

- Pre-impact actions that provide the human and material resources needed to support active responses at the time of hazard impact
- Community hazard/vulnerability analysis (HVA)
- Communities should develop emergency operations plans, conduct emergency response training, acquire facilities and equipment, and perform emergency drills, exercises and critiques
- Increased federal support since 9/11

**The Role of Health Departments in Preparedness**

- LHDs are first-line responders for all incidents involving the health of the community
- Essential elements in planning at the local level for all types of threat (including bioterrorism):
  - Readiness and impact assessment
  - Expansion of surveillance and epidemiology capacity
  - Infection control measures including isolation and quarantine
  - Mass provision of clinical interventions (vaccine or medications)
  - Coordination and capacity assessment of health care delivery system

**Public Health Response**

- Conduct initial assessments of health needs
  - viability of the health care infrastructure, including the drug supply
  - environmental infrastructure (food, water, sanitation, and vector control)
  - the needs of the elderly and other special populations
  - level of access to health care providers (acute, continuity of care, primary care, and emergency care)
- Applied epidemiology
- Plan for the delivery of services
- Encompasses relief efforts

**Disaster Response Observations**

1. Emergency response units often self-dispatch.
2. Most initial search and rescue is carried out by the survivors themselves.
3. Casualties are likely to bypass on-site triage and go directly to hospitals.
4. Most casualties arrive at hospitals by private cars, police vehicles, buses, taxis, or foot.
5. Hospital notification come from victims or news media rather than from authorities in field.
6. The least serious casualties often arrive first (“reverse-triage”)

**Disaster Response Levels**

- Level I
  - Local emergency response personnel and organizations contain and deal effectively with the disaster and its aftermath
- Level II
  - Requires regional efforts and mutual aid from surrounding communities
- A Level III
  - Local and regional assets are overwhelmed, requiring statewide or federal assistance
Local Health Departments Disaster Response

- LHDs identify key responders in the community, including emergency medical services, HAZMAT, and police and fire agencies
- The American Red Cross (ARC) provides emergency shelter; basic health services for those residing in shelters; food services on-site and in shelters; counseling (including mental health services or referrals); and family reunification.
- Discussions about coordinating the response and surveillance should also take place with hospitals and poison control centers.

Disaster Escalation

- In the event of insufficient local resources
  - Escalate a request to the state or federal level
  - Request for outside aid called “escalate upward”
  - Federal resources may require 72 hours to arrive
- Federal resources are made available to the states
  - National Guard
  - CDC (i.e., Epidemic Intelligence Service)
  - U.S. Public Health Service (i.e., the Agency for Toxic Substances and Disease Registry)

State-level Response

- All states have an emergency management authority (EMA), sometimes called an office of emergency preparedness (OEP)
  - Coordinates all state resources including the state’s health department, housing and social services agencies, and public safety agencies (i.e., state police)

Federal Response

- Multiple layers of law and regulations
- Stafford Act (1988)
  - Federal Emergency Management Agency (FEMA) carries out the provisions
- Homeland Security Act of 2002 (DHS)
  - DHS coordinates federal programs and assists states via coordination and on-scene command structures
  - Federal Emergency Management Administration (FEMA)
- Post Katrina Emergency Management Reform Act of 2006
  - Correct the errors of FEMA’s management following Hurricane Katrina

Disaster Recovery

- Begins with stabilization of an incident and ends when the community has re-established normal social, economic and political routines
- Public health concerns:
  - Water quality
  - Food
  - Shelter
  - Sanitation
  - Vector control

Epidemiologic Activities in Disaster Response

- Rapid needs assessment
- Disease surveillance
- Descriptive and analytic investigations
- Data collection
  - Demographic characteristics of the affected area and surrounding vicinities
  - Casualty assessment, including deaths, injuries, and selected illnesses
  - Assessment of the needs of displaced population
  - Coordination of volunteer assistance
• A global recognition risk from bioterrorism and other emerging threats such as Severe Acute Respiratory Syndrome (SARS) and pandemic influenza.

• Public health role in the following examples:
  – Hurricane Katrina
  – Terrorism preparedness (smallpox threat)
  – Pandemic Influenza
  – SARS
  – Avian flu
  – Boston Marathon bombing

**Disaster Examples**

**Hurricane Katrina**

• Public health response included:
  – Investigations of infectious disease
  – Environmental assessments
  – Morbidity and mortality surveillance
  – Shelter-based surveillance
  – Community health and needs assessments
  – Location and follow-up of displaced persons with tuberculosis
  – Broad utilization of immunization registries for displaced children.

**Terrorism Preparedness**

• Likelihood of a chemical or biological warfare attack increasing

• Pandemic & All-Hazards Preparedness Act of 2006 and BARDA

• Five highest priorities among the diseases on the threat list:
  1. Anthrax
  2. Smallpox
  3. Plague
  4. Botulism
  5. Tularemia

**Smallpox Threat**

• Smallpox eradicated from the natural world, but is viewed as a possible threat.

• According to NYT, the U.S. “government is buying enough of a new smallpox medicine to treat two million people in the event of a bioterrorism attack.”

• Biomedical Advanced Research and Development Authority (BARDA), within the Office of the Assistant Secretary for Preparedness and Response in the U.S. Department of Health and Human Services

• Vaccine a part of our Strategic National Stockpile

**Influenza**

• Annually results in more than 200,000 hospitalizations, 36,000 to 40,000 deaths, and $1 billion to $3 billion in direct costs for medical care in the U.S.

• Spreads rapidly and can be transmitted by those who are asymptomatic but infected, leading to the near simultaneous occurrence of multiple community outbreaks in an escalating fashion.

**Pandemic Influenza**

• Explosive global events
  – Most, if not all, persons are at risk for infection
    – Virus is capable of efficient human-to-human transmission
    – Expected to begin in the fall to spring seasons and multiple waves are likely to occur three to 12 months after the initial outbreak
    – Events can quickly overwhelm countries and their health systems that have not made adequate preparation.

• Occurs on average every three to four decades when a new strain of the flu emerges.

Why Control by Vaccination is Problematic

• Should the virus change, vaccine developed today is likely to be less effective, if it protects at all.
• When a new influenza strain spreads worldwide, sufficient vaccine won’t be available for 6 to 8 months due to current manufacturing capabilities.
• Annual delivery of the vaccine to the U.S. is unpredictable for the influenza strains currently in circulation.
• To alleviate concerns, the federal government has earmarked over a billion dollars to develop cell-based vaccine and manufacturing capacity in the U.S.
• Recent cell-based flu vaccines seen as an incremental improvement.

Vaccine and Antiviral Distribution for Pandemic Flu

• Because of limited supply, procedures have to be established to:
  – Acquire and take delivery of the drugs
  – Prioritize who will receive available drugs
  – Carry out public health planning and preparedness for pandemic flu
  – Track supplies, their distribution and use
  – Conduct mass vaccination clinics
  – Track adverse events due to vaccination.

Inpatient Planning for Pandemic Flu

• Surge capacity issues (25% increase in demand for inpatient resource) coupled with hospital staff absenteeism.
• Hospital preparations should address:
  – Role of triage centers and home care
  – Guidance for hospital employees
  – Infection control guidelines
  – Mass mortality issues
  – Support for staff and their families
  – Tracking hospital resources.

Severe Acute Respiratory Syndrome

• First reported in Asia in February 2003.
• 8,098 people worldwide became sick, 774 died.
• Chinese cover-up.
• Eventually contained in 2003.
• World Health Organization (WHO) agreed on a new set of rules for responding to outbreaks.
• U.S. Biomedical Advanced Research and Development Authority (BARDA) has 130 products in development, including 45 for influenza.

Current Event: China and Avian Flu

• Avian flu can be transmitted from birds to humans.
• H7N9 influenza - China reported 87 cases and 17 fatalities from late March to mid April 2013.
• As of April 18, Chinese public health officials suspect that human-to-human transmission has occurred.
• They warned of a potential pandemic should H7N9 this mutation be confirmed to have occurred.
• CDC began working on vaccine within a week of the reported Chinese outbreak.

Current Event: Boston Marathon Bombings

• Emergency Medical Service (EMS) system key to disaster response -- "The distribution worked wonderfully" and "none of the hospitals were overwhelmed." 1
• CDC report stated that "most U.S. hospitals had regional communication systems to track available hospital beds" and almost 80% "had plans for explosive or incendiary accidents or attacks." 2
• Arriving patients were "tested with elaborate detectors for hazardous residue in an effort to rule out a chemical or radiological attack." 3
• Doctors described operation at the hospitals following the bombings response as "calm and efficient." 4
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<td>1. Describe the steps of the CDC model for ensuring community health safety.</td>
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<td>2. Give an example of state-level agenda setting for a population health problem important to you.</td>
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<td>3. Explain the difference between primary and secondary disaster prevention/mitigation.</td>
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<td>4. In the event of insufficient local resources, what should the local public health authorities do?</td>
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<td>5. Name a reason that federal response policy is complex.</td>
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<td>6. Describe three epidemiological activities in the impact phase of disaster response.</td>
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