ASPPH and CDC PERLC Webinar: Using Root Cause Analysis and Peer Assessment to Learn from Experiences with Public Health Emergencies

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Today’s Presenters

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Public Health Emergency Preparedness (PHEP) systems must learn from “critical incidents”

- Our work has focused on preparedness for the health consequences of large-scale emergencies and disasters
  - Anthrax attacks (2001)
  - SARS
  - Hurricane Katrina (2005)
  - H1N1 influenza (2009)

- How do we ensure that the “lessons learned” are
  - Valid
  - Implemented
Current approaches to assessing PHEP

• Unstructured assessments
  *Are you prepared?*
  *What have we learned?*

• Inventories & capacity assessments
  *Have we done what’s recommended?*

• Drills and exercises
  *Would we be prepared?*

• Actual events – critical incidents
  *Were we prepared?*
  *What gaps in preparedness exist?*

Using HSEEP formatted Exercise Evaluation Guides (EEGs) and After Action Reports (AARs)
Problems with *typical* HSEEP AARs

- Focus on Target Capability Lists (TCL)
  - Many TCLs are capacities rather than capabilities
  - One TCL/“observation” at a time
  - Assumes that the plan applies to the situation
    - Vaccine available all at once, demand high
    - NIMS model for communication
- More focus on form than probing, objective analyses
  - Root cause analysis optional
  - “Lessons learned” optional
- Improvement plans
  - Often missing altogether
  - Little analysis
- Prepared by emergency planners
  - Rather than subject matter experts
Primary challenge: Critical incidents are “singular events” - unique in context and specifics

- Most of us were taught that rigorous evaluation focuses on patterns discerned through statistical analysis of large samples
  - “Don’t let your estimates be skewed by outliers”
  - “the plural of ‘anecdotes’ is not ‘data’”
- QI methods rely on statistical measurements
  - Singular nature of emergencies limits measurement opportunities
- What do you do when all you have is a small number of singular events?
Additional challenges

• Public health “system” is fragmented
  – City, county, and state departments
    • Structure and function vary
  – Non public health partners
    • Health care, policy, EMS, media, ...
    – Who’s responsible for what?

• Effective response is complex and multi-factorial
  – Not always clear what is effective and needs to be done
  – Don’t know “counterfactuals”
Some possible solutions

- Focus on **capabilities** rather than **capacities**
  - Capacities
    - resources—infrastructure, response mechanisms, knowledgeable and trained personnel—that a public health system has to draw upon
    - inventories may not predict response capabilities or outcomes
  - Capabilities
    - actions a public health system is capable of taking to effectively identify, characterize, and respond to emergencies
    - can be assessed in small and large event
- For QI purposes, ask
  - *How and why* the system (not just specific capabilities) performed as it did
  - Not only *how many or how well* the system performed
“Facilitated look-back” methodology

• Established method for examining public health systems’ emergency response capabilities and for conducting a candid systems-level analysis (RAND TR-320 http://www.rand.org/pubs/technical_reports/TR320.html)

• Structured discussions with
  – public health leaders and key staff
  – stakeholders involved with the response

• Neutral facilitator and a no-fault approach

• Dimensions of decisions are probed and nuances in past decision-making explored
Root cause analysis

• Goal: move from superficial, proximate causes to system-level root causes by repeatedly asking *why* each identified problem occurred

• Focuses on primary response challenges, immediate causes that lead to the challenges, and contributing factors
  – Contributing factors can be modifiable, un-modifiable, or pre-determined root causes

• Identifies lessons learned from adaptations and solutions that met response challenges
Root cause analysis model

• Includes the following components:
  – Response challenge
  – Objective or goal
  – Immediate causes
  – Contributing factors [i.e. root causes]
  – Lessons learned
  – Adaptations and Solutions

• Benefits:
  – Variety of stakeholders address critical issues rather than attributing blame
  – Root causes tend to be system rather than personal issues
Example: 2008 Salmonella outbreak

- Alamosa County, CO
  - rural community in Southwestern Colorado with a population of approximately 15,000
  - one of the poorest in Colorado
  - many citizens are home-bound or have limited modes of communication
  - large Hispanic and Mormon populations
  - one public school system and one state university

- County “health department”
  - Alamosa County Nursing Services (ACNS)
  - supported by regional epidemiologist, preparedness staff, ...

- City of Alamosa has separate administration
  - responsible for public works including the management of the water supply
  - knew the water supply was not chlorinated, and that there was at least one break in the water system.
Identifying the source of the problem

- Fri., Mar. 7: First cases of severe GI disease present at local medical facility
- Sat., Mar. 8: Regional epidemiologist assembles team and starts to interview cases
- McDonald’s originally thought to be the source, but case in infant and mapping suggested water system
- Wed., Mar. 19: Water system confirmed as source
Story Arc: Residents of Alamosa County were becoming ill with a severe gastrointestinal illness at abnormally high rates. Approximately twenty cases were identified before the public works department admitted that the water system could be to blame.

Objective: Identify the source of the outbreak causing residents of the Alamosa area to get sick to mitigate the spread of the disease.

Related Capability: Public Health Surveillance and Epidemiological Investigation (CDC PHP 13)

Lessons for Systems Improvement:
- The city and county must communicate to conduct outbreak investigations successfully
- The water supply must be chlorinated to prevent outbreak
- Public works needs to develop an ongoing relationship with public health and emergency operations

Directly impacted whether the objective was met

Shaped the lessons learned and resulting improvement plan

Typical AAR finding:
- “It took to long to find the source” Not helpful for future events!
Peer Assessment for PHEP

• One challenge with learning from critical incidents is ensuring objective, systematic, and reliable analyses
  – difficult if officials evaluating their own response
• Assessment by peers offers potential for
  – Reliable and objective analyses by professionals familiar with
    • Public health preparedness
    • Particularities of the responding PHEP system
  – “more hands”
• Can be effective way to share best practices across jurisdictions
  – Evidence from Health Officers Assoc. of Calif., ...
The peer assessment process

• Field trials in
  – Alamosa, CO – 2008 Salmonella
  – Dallas Metroplex, TX – 2012 West Nile Virus

• Just-in-time training

• Lessons learned
  – Participants contribute a variety of perspectives to incident
  – Process encouraged thoughtful engagement especially for those with different viewpoints
  – Peer assessors contribute to meaningful discussion through facilitation
  – Follow up reports can be used to improve existing reviews
Learning from critical incidents

• National Health Security Strategy calls for systematic quality improvement (QI) approach to enhance national health security

• Needed: Critical Incident Registry (CIR) for Public Health Emergency Preparedness

• Registry concept
  – Database of incident reports filed by public health agencies that responded to a critical incident

• Objectives
  – Drive organizational improvement through careful post-event analysis of “own” events
  – Facilitate identification and sharing of “best practices”
  – Facilitate cross-case analyses to identify contexts and mechanisms that determine success
Scope: What is a critical incident?

• Public health played a significant role
  – tested one or more public health preparedness capabilities
• Incident was “meaningful”
  – magnitude of morbidity or social disruption
  – stretch response capabilities and reveal critical vulnerabilities
  – significantly altered systems behavior or beliefs
  – helped to identify best practices
  – captured the PHEP community’s attention
• Appropriate scope (time and organizations) to capture the event (“bite size chunk”)
Critical incidents in the last decade

• Bioterrorism: Anthrax, smallpox vaccination
• Emerging and re-emerging pathogens
  – West Nile virus, SARS, Monkeypox, measles
  – H5N1 (avian) influenza, H1N1 (swine) influenza
• Foodborne disease outbreaks
  – Hepatitis A, Salmonella
  – E. coli in meat products, lettuce, bean sprouts
• Natural disasters: Katrina, Irene, Sandy
• Boston Marathon bombing
• Other incidents
  – 2004 flu vaccine shortage
How a CIR could enhance learning from experience in PHEP

Self-prepared AAR/IP

Analytical tools
- Surveys
- Focus groups
- Interviews
- Facilitated look-backs
- After action conferences
- Root cause analysis

External assessors
- Peers
- Academic
- CIR staff

Critical Incident Registry (CIR)

Own system improvement

Sharing best practices

PHEP research
Report structure

• Common structure that facilitates analysis of individual incidents and supports cross-case analysis
  – Structured summary, searchable by
    • Practitioners looking for best practices
    • Researchers looking to identify trends across incidents
  – Relevant context: Characteristics of the responding public health system, including history and training
  – Major events in the incident: Timeline
  – Analysis of PHEP system’s role: PHEP capabilities tested at high enough level to allow generalization

• Just enough detail to understand why particular mechanisms worked in that context
  – Standard descriptions of context & PHEP capabilities
Reporting

• Reporting requirements
  – Mandatory reporting with penalties (e.g. FAA)
  – Condition of funding (e.g. CDC cooperative agreements)
  – Voluntary

• Barriers
  – Staff time, effort and skills
  – Embarrassment or liability concerns

• Incentives
  – Clarify goal of organizational learning
  – Provide support
    • RCA “tool” and training
    • Peers
      • Schools of public health
  – Reward thoughtful reports
Next steps

• Continue developing training materials & approaches
  – toolkit and on-line training
  – case examples
  – Rapid dissemination of the RCA tool

• More pilot tests
  – both the RCA and peer assessment components
  – help us continue refining the training and assess feasibility of asking peer assessors to take this on
  – In progress: Kanawha Charleston, West Va.

• More discussions with organizations that might be interested in hosting a registry, and supporting the process of identifying and training peer assessors
Questions?
For more information please see:
http://www.hsph.harvard.edu/h-perlc/

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