Examining Health Workers' Perceptions of Organizational Expectations Following Disasters: Practice-Based Perspectives

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Learning Objectives

1. Describe the relevance of perceived threat and efficacy on health workers’ attitudes toward professional role fulfillment post-disaster in varied scenarios, including radiological terrorism.

2. Identify potential interventions to enhance response willingness toward public health emergencies and disasters.

3. Describe public health workers’ perceptions toward recovery-phase role fulfillment.
A Spectrum of Public Health Emergency Threats
Public Health Emergency Preparedness System

- Health Care Delivery Systems
- Homeland Security and Public Safety
- Communities
- Employers and Business
- Governmental Public Health Infrastructure
- Academic
- The Media

Source: IOM 2002
RWA Framework

- Collectively comprises necessary/sufficient elements for public health emergency preparedness response systems

“Willingness” to Respond

- State of being inclined or favorably predisposed *in mind*, individually or collectively, toward specific responses
- Numerous personal and contextual factors may contribute
- Beliefs, understandings, and role perceptions
- *Scenario-specific*
Headlines: Ebola

*Delay in Dallas Ebola Cleanup as Workers Balk at Task*

By KEVIN SACK and MANNY FERNANDEZ  OCT. 2, 2014

Madrid hospital staff quit over Ebola fears

*Ashifa Kassam in Madrid*  Friday 10 October 2014 18.13 EDT
Ebola Health Workers in Liberia: Give Us More Danger Money or We Strike

By Jayalakshmi K
October 13, 2014 07:59 BST

Bellevue staffers call in ‘sick’ after Ebola arrives

By Jamie Schram and Larry Celona
October 25, 2014 | 1:03am
Pan Flu Response Willingness Pilot Study: Maryland 2005

- Only 53.8% indicated they would likely report to work during influenza pandemic
- Only 33% considered themselves knowledgeable about public health impact of pandemic flu
- Perception of the importance of one’s role in the agency’s overall response was the single most influential factor associated with willingness to report
  - Multivariate OR: 9.5; CI 4.6–19.9

The Extended Parallel Process Model and JH~PHIRST
JH~PHIRST: Design and Concept

- Johns Hopkins ~ Public Health Infrastructure Response Survey Tool (JH~PHIRST)
- Adopt Witte’s Extended Parallel Processing Model (EPPM)
  - Evaluates impact of threat and efficacy on human behavior
- Online survey instrument
- All-hazards scenarios
  - Weather-related
  - Pandemic influenza
  - ‘Dirty’ bomb
  - Inhalational anthrax
The Extended Parallel Process Model (EPPM)

MESSAGE COMPONENTS

Perceived Threat?
Susceptibility/Severity

- NO: Disregard
  - Message Rejection

- YES: Perceived Efficacy?
  - YES: Self-Efficacy/Response Efficacy
    - YES: Danger Control
      - Message Acceptance
    - NO: Fear Control
      - Message Rejection
  - NO: Message Rejection
Threat Appraisal

- Susceptibility
  - “A _______ disaster is likely to occur in this region.”

- Severity
  - “If it occurs, a _______ disaster in this region is likely to have severe public health consequences.”

Efficacy Appraisal

- Self-efficacy
  - “I would be able to perform my duties successfully in the event of a _______ disaster.”

- Response efficacy
  - “If I perform my role successfully it will make a big difference in the success of a response to a _______ disaster.”
“Concerned and Confident”

- Four broad categories identified in the JH ~ PHIRST assessment tool:
  - Low Concern/Low Confidence (low threat/low efficacy)
    - Educate about threat, build efficacy
  - Low Concern/High Confidence (low threat/high efficacy)
    - Educate about threat, maintain efficacy
  - High Concern / Low Confidence (high threat/low efficacy)
    - Improve skill, modify attitudes
  - High Concern / **High Confidence** (high threat/high efficacy)
    - Reinforce comprehension of risk and maintain efficacy
Some Projects to Date

- EMS Providers
- Medical Reserve Corps Volunteers
- Hospital Workers
- Local Health Departments
Overarching findings

- “Concerned and confident” (HT/HE) profile is, in general, most strongly associated with WTR across all hazards
- Perceived efficacy outweighs perceived threat
- Compared to the other three scenarios, the dirty bomb scenario has consistently lower rates of agreement for willingness to respond and related constructs
Hospital Workers
Survey Distribution

- Survey distributed to all Johns Hopkins Hospital Workers (n=18,612)
- January – March 2009
- Response Rate = 18.4% (n=3,426)
### Hospital Workers’ Self-Reported Willingness to Respond

<table>
<thead>
<tr>
<th></th>
<th>Pandemic Influenza</th>
<th>Radiological (‘dirty’) Bomb</th>
</tr>
</thead>
<tbody>
<tr>
<td>If <em>required</em></td>
<td>82.5%</td>
<td>72%</td>
</tr>
<tr>
<td>If <em>asked</em></td>
<td>72%</td>
<td>61%</td>
</tr>
</tbody>
</table>
Anesthesiology & Critical Care Medicine: Self-Reported Willingness to Respond by Professional Category

<table>
<thead>
<tr>
<th></th>
<th>Pandemic Influenza</th>
<th>Radiological (‘dirty’) Bomb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Physicians</td>
<td>Nurses</td>
</tr>
<tr>
<td><strong>If required</strong></td>
<td>95.7%</td>
<td>78.3%</td>
</tr>
<tr>
<td><strong>If asked</strong></td>
<td>84.5%</td>
<td>56.5%</td>
</tr>
<tr>
<td><strong>Regardless of Severity</strong></td>
<td>83.0%</td>
<td>50.0%</td>
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</table>
### Hospital Workers’ Willingness to Respond and EPPM if required

#### Extended Parallel Processing Model Category

<table>
<thead>
<tr>
<th></th>
<th>Low threat, Low Efficacy</th>
<th>Low threat, High Efficacy</th>
<th>High threat, Low Efficacy</th>
<th>High threat, High Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td>Pan Flu</td>
<td>1.00</td>
<td>Ref</td>
<td>13.09</td>
<td>7.67, 22.34</td>
</tr>
<tr>
<td>Dirty Bomb</td>
<td>1.00</td>
<td>Ref</td>
<td>12.90</td>
<td>7.80, 21.34</td>
</tr>
</tbody>
</table>
Key Findings in Hospital Workers

- Concerned and confident profile (HT/HE) vs LT/HE profile
- Perceived need for training high
- Nurses less likely to respond than physicians [OR(95%CI): 0.61 (0.45, 0.84)] in a pandemic influenza emergency
- Perceived threat had little impact on willingness in the radiological ‘dirty bomb’ emergency scenario
Potential Response Willingness Interventions for Hospital Employees

- Hospital-based communication and training strategies to boost employees' response willingness, including:
  - promoting pre-event plans for dependents;
  - ensuring adequate supplies of personal protective equipment, vaccines and antiviral drugs for all hospital employees;
  - **efficacy-focused training**
Local Health Department Workers
Local Public Health Workforce: Specific Aims

- Characterize scenario-based differences in emergency response willingness using EPPM, to identify common and differentiating patterns
  - Baseline JH~PHIRST administration to LHD “clusters”
  - Multiple FEMA Regions
  - Urban and Rural
Specific Aims (cont’d)

- Apply EPPM to inform programmatic efforts for enhancing emergency response willingness in public health system
  - Administer EPPM-centered curriculum to LHDs
  - Tailored to address baseline JH~PHIRST-identified gaps in willingness to respond
  - Train-the-trainer model
  - Training vs. Control LHDs
  - 3 re-surveys of LHDs with JH~PHIRST to measure short- (1 wk), medium- (6 mo.), and long-term (2 y) impacts of training
  - Focus groups with all re-surveys
Survey Administration

4 **Rural** Health Department Clusters
- Idaho
- SW Minnesota
- SE Missouri
- Lord Fairfax District, VA

4 **Urban** Health Department Clusters
- Florida
- Indiana (Greater Indianapolis Metro Area)
- Wisconsin (Milwaukee/Waukesha Consortium)
- Oregon (Portland metro)/Washington State
### JH~PHIRST Baseline Findings: Willingness-to-Respond (all 8 clusters)

<table>
<thead>
<tr>
<th></th>
<th>Weather-Related</th>
<th>Pandemic Influenza</th>
<th>Radiological (‘dirty’) Bomb</th>
<th>Anthrax Bioterrorism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If required</strong></td>
<td>93%</td>
<td>91%</td>
<td>74%</td>
<td>80%</td>
</tr>
<tr>
<td><strong>If asked</strong></td>
<td>83%</td>
<td>80%</td>
<td>62%</td>
<td>69%</td>
</tr>
<tr>
<td><strong>Regardless of Severity</strong></td>
<td>77%</td>
<td>79%</td>
<td>53%</td>
<td>65%</td>
</tr>
</tbody>
</table>
How Can We Further Address Willingness Gaps?
EPPM-Centered Curricular Intervention

• **Public Health Infrastructure Training (PHIT)**
  – Designed to address the attitudinal and behavioral gaps in willingness-to-respond
  – **Objective:** Extend levels of threat awareness, self- and response-efficacy
  – **Goal:** Increased system capacity with higher numbers of workers who are willing to respond to all hazards
  – **Train-the-trainer format**
  – Seven hours of content delivered over a 6-month period
  – Combines a variety of learning modalities in three phases of training
    - Face-to-face lecture and discussion; online learning; independent activities; case scenarios; tabletop exercises; role-playing; knowledge assessments; peer critiques
PHIT Curriculum: TOC

- **Phase 1: Facilitator-Led Discussion** (2 hours)
  - Part 1: Overview of Scenarios and Public Health’s Role
  - Part 2: Emergency Scenario Contingency Planning
- **Phase 2: Independent Learning Activities** (3 hours)
- **Phase 3: Group Experiential Learning** (2 hours)
  - Part 1: Tabletop Exercise
  - Part 2: Role-Playing Exercise
  - Part 3: Debriefing

While the content and phases are mostly fixed, local contextual examples are encouraged & formats for training delivery are flexible and scalable to meet the unique needs of health departments.
Pre- vs. Post-Intervention Data
## JH~PHIRST Baseline Comparisons to Resurvey: WTR (Severity)

### Willingness-to-Respond: Regardless of Severity
Baseline – Resurvey 1 – Resurvey 2

<table>
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<th>Anthrax Bioterrorism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONTROL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>82% ↓ 78% ↓75%</td>
<td>85% ↓ 84% ↓78%</td>
<td>60% ↓ 58%↓55%</td>
<td>78% ↓ 67% ↓66%</td>
</tr>
<tr>
<td><strong>INTERVENTION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>79% ↑ 80% ↓79%</td>
<td>83% ↑ 85% ↓82%</td>
<td>57% ↑ 73% ↓71%</td>
<td>69% ↑ 77% ↓73%</td>
</tr>
</tbody>
</table>
## JH~PHIRST Baseline Comparisons to Resurvey Findings: Efficacy

### Self-Efficacy

Baseline – Resurvey 1 – Resurvey 2

<table>
<thead>
<tr>
<th>Self-Efficacy</th>
<th>Weather-Related</th>
<th>Pandemic Influenza</th>
<th>Radiological (‘dirty’) Bomb</th>
<th>Anthrax Bioterrorism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONTROL</strong></td>
<td>84% ↓ 80% ↑81%</td>
<td>87% ↓ 85% ↓82%</td>
<td>50% ↓ 52% →52%</td>
<td>71% ↓ 68% ↓66%</td>
</tr>
<tr>
<td><strong>INTERVENTION</strong></td>
<td>83% ↑ 87% →87%</td>
<td>85% ↑ 90% ↓87%</td>
<td>50% ↑ 79% ↓75%</td>
<td>66% ↑ 80% ↓79%</td>
</tr>
<tr>
<td>Response-Efficacy</td>
<td>Weather-Related</td>
<td>Pandemic Influenza</td>
<td>Radiological (‘dirty’) Bomb</td>
<td>Anthrax Bioterrorism</td>
</tr>
<tr>
<td>------------------</td>
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<td>-------------------</td>
<td>-----------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>CONTROL</strong></td>
<td>85% ↓ 76% ↓ 74%</td>
<td>84% ↑ 86% ↓ 77%</td>
<td>69% ↓ 63% → 63%</td>
<td>78% ↓ 71% ↓ 68%</td>
</tr>
<tr>
<td><strong>INTERVENTION</strong></td>
<td>83% ↑ 86% ↓ 83%</td>
<td>85% ↑ 87% ↓ 85%</td>
<td>70% ↑ 82% ↓ 78%</td>
<td>76% ↑ 82% ↓ 79%</td>
</tr>
</tbody>
</table>
Key Focus Group Findings

- Participants reported increased understanding of the importance of their roles in the context of a public health emergency response, and the potential impacts on the health department and the community if they chose not to respond.
Key Focus Group Findings (cont’d)

- The importance of being confident in the safety of one’s family was discussed by participants in multiple clusters as particularly important related to response willingness.
- Some clusters reported that their health departments still have work to do in defining health department and employee roles and responsibilities, and developing policies surrounding expectations of all parties.
Recommendations
Policy and Programmatic Recommendations

- Project-relevant and consistent themes found across clusters for future policy and programmatic consideration include:
  - Ensure worker safety during emergencies, and communicate effectively regarding those plans
  - Require employees to have a personal/family preparedness kit
  - A perceived (or actual) requirement to report to work during emergencies to boost self-reported willingness to respond
  - Agency efforts to encourage workforce response during times of emergency should highlight each employee’s relevance and importance.

- Effective, ongoing, and reliable communication with the workforce is key
Policy and Programmatic Recommendations (cont’d)

- Utilize EPPM framework in the development and implementation of emergency response training programs
  - Encourage both self-efficacy and response-efficacy
  - All employees have an important role to play in an emergency event
- Reconsider organizational expectations toward response requirements
- Increased focus of curricular interventions on preparation for a radiological emergency
Current & Next Steps
Current/Next Steps

- Applying EPPM to novel training intervention for boosting public health workers’ sense of efficacy toward disaster and shoring up willingness gaps toward disaster recovery.
Disaster Life Cycle
Figure 2: Recovery Continuum – Description of Recovery Activities by Phase [Excerpted from National Disaster Recovery Framework (FEMA 2011)]

**Pre-Disaster Preparedness**
- Pre-disaster recovery planning
- Mitigation planning and implementation
- Community capacity and resilience-building
- Conducting disaster preparedness exercises
- Partnership building
- Articulating protocols in disaster plans for services to meet the emotional and health care needs of adults and children

**Short-Term Recovery**
- Examples include:
  - Mass Care/Sheltering
    - Provide integrated mass care and emergency services
  - Debris
    - Clear primary transportation routes
  - Business
    - Establish temporary or interim infrastructure to support business reopens
    - Reestablish cash flow
  - Emotional/Psychological
    - Identify adults and children who benefit from counseling or behavioral health services and treatment

**Intermediate Recovery**
- Examples include:
  - Housing
    - Provide accessible interim housing solutions
  - Debris/Infrastructure
    - Initiate debris removal
    - Plan immediate infrastructure repair and restoration
  - Business
    - Support reestablishment of businesses where appropriate
  - Emotional/Psychological
    - Engage support networks for ongoing care
    - Public Health and Health Care
      - Provide emergency and temporary medical care and establish appropriate surveillance protocols
      - Mitigation Activities
        - Assess and understand risks and vulnerabilities
      - Public Health and Health Care
        - Ensure continuity of care through temporary facilities
      - Mitigation Activities
        - Inform community members of opportunities to build back stronger
      - Public Health and Health Care
        - Reestablishment of disrupted health care facilities
      - Mitigation Activities
        - Implement mitigation strategies

**Long-Term Recovery**
- Examples include:
  - Housing
    - Develop permanent housing solutions
  - Infrastructure
    - Rebuild infrastructure to meet future community needs
  - Business
    - Implement economic revitalization strategies
  - Emotional/Psychological
    - Follow-up for ongoing counseling, behavioral health, and case management services

**NATIONAL RESPONSE FRAMEWORK (NRF)**

**NATIONAL DISASTER RECOVERY FRAMEWORK (NDRF)**

**Size and Scope of Disaster and Recovery Efforts**
Hurricane Sandy CDC Recovery Project

- Mixed-methods EPPM-centered randomized controlled study (underway)
  - Examining LHD workers’ sense of efficacy (and facilitators & barriers thereof) through:
    - focus groups
    - quantitative survey/resurvey with online survey instrument (Disaster Recovery Infrastructure Survey Tool [JH-DRIST])
  - Cohort = 8 LHDs from Maryland and New Jersey in Hurricane Sandy-impacted jurisdictions (n = 1020 LHD employees)
## Perceptions of Likelihood of Being Asked & Willingness To Participate in Recovery from Future Disasters

<table>
<thead>
<tr>
<th></th>
<th>MD</th>
<th>NJ</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely?</td>
<td>87%</td>
<td>86%</td>
<td>87%</td>
</tr>
<tr>
<td>Willing?</td>
<td>81%</td>
<td>85%</td>
<td>82%</td>
</tr>
</tbody>
</table>
# Efficacy Perceptions by Recovery-Phase and Future

<table>
<thead>
<tr>
<th></th>
<th>Days - Wks</th>
<th>Wks - Mos</th>
<th>Mos - Yrs</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy (Knowledge)</td>
<td>70%</td>
<td>72%</td>
<td>74%</td>
<td>71%</td>
</tr>
<tr>
<td>Self-Efficacy (Confidence)</td>
<td>73%</td>
<td>72%</td>
<td>74%</td>
<td>72%</td>
</tr>
<tr>
<td>Response Efficacy</td>
<td>56%</td>
<td>61%</td>
<td>62%</td>
<td>71%</td>
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</table>
Curricular Intervention: PH STRiDR

- EPPM-centered curricular intervention
  - Public Health System Training in Disaster Recovery [PH STRiDR]
    - Train-the-trainer curriculum
    - Facilitated-discussion centered
    - Adult learning theory
    - Four 90-minute sessions administered over 3- to 4-month window
    - Designed to enhance LHD workers’ sense of efficacy toward disaster recovery
Overview of Sessions: PH STriDR Curriculum

- **Session 1**
  - Introduce long term recovery, LHD role, and likely local hazards

- **Session 2**
  - Identify worker roles and responsibilities in LHD recovery

- **Session 3**
  - Identify potential issues in personal/family and workplace recovery and resources and actions to prepare for them

- **Session 4**
  - Describing overarching vision of LHD disaster recovery efforts and how employees fit into it


References (cont’ d)


Thank You

Questions?
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