Disaster Preparedness:
Public Health Infrastructure and
Perspectives on Community Resilience

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1. Describe the influences of perceived threat and efficacy on willingness to respond in public health emergencies.

2. Describe emergency scenario-specific patterns of response willingness.

3. Identify potential interventions to enhance response willingness within the public health emergency preparedness system.
Background
A Spectrum of Public Health Emergency Threats

- TIME Magazine cover: Bird Flu, Is Asia hatching the next human pandemic?
- Image of a tornado
- Image of a dirty bomb
Public Health Emergency Preparedness System

- Health Care Delivery Systems
- Homeland Security and Public Safety
- Communities
- Employers and Business
- 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*
Johns Hopkins Public Health Infrastructure Response Survey Tool (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 → Danger Control → Message Acceptance

Perceived Efficacy?
- Self-Efficacy/Response Efficacy
  - YES → 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 Launched to Date

- 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><strong>If required</strong></td>
<td>82.5%</td>
<td>72%</td>
</tr>
<tr>
<td><strong>If asked</strong></td>
<td>72%</td>
<td>61%</td>
</tr>
<tr>
<td></td>
<td>Pandemic Influenza</td>
<td>Radiological (‘dirty’) Bomb</td>
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<td>--------------------------</td>
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</tr>
<tr>
<td></td>
<td>Physicians</td>
<td>Nurses</td>
</tr>
<tr>
<td>If required</td>
<td>95.7%</td>
<td>78.3%</td>
</tr>
<tr>
<td>If asked</td>
<td>84.5%</td>
<td>56.5%</td>
</tr>
<tr>
<td>Regardless of Severity</td>
<td>83.0%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>
## Hospital Workers’ Willingness to Respond and EPPM if required

<table>
<thead>
<tr>
<th>Extended Parallel Processing Model Category</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**
How Can We Further Address Willingness Gaps?
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 (Local Health Departments)
### JH~PHIRST Baseline Comparisons to Resurvey: WTR (Severity)

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

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<tr>
<th></th>
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<tr>
<td><strong>CONTROL</strong></td>
<td></td>
<td></td>
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<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>
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<tr>
<td></td>
<td>79% ↑ 80% ↓ 79%</td>
<td>83% ↑ 85% ↓ 82%</td>
<td>57% ↑ 73% ↓ 71%</td>
<td>69% ↑ 77% ↓ 73%</td>
</tr>
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## JH~PHIRST Baseline Comparisons to Resurvey Findings: Efficacy

### Self-Efficacy
Baseline – Resurvey 1 – Resurvey 2

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<tr>
<td></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>
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<tr>
<td></td>
<td>83% ↑ 87% →87%</td>
<td>85% ↑ 90% ↓87%</td>
<td>50% ↑ 79% ↓75%</td>
<td>66% ↑ 80% ↓79%</td>
</tr>
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### JH~PHIRST Baseline Comparisons to Resurvey Findings: Efficacy

<table>
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<th>Response-Efficacy</th>
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<tr>
<td>85% ↓ 76% ↓ 74%</td>
<td>84% ↑ 86% ↓ 77%</td>
<td>69% ↓ 63% → 63%</td>
<td>78% ↓ 71% ↓ 68%</td>
<td></td>
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<tr>
<td><strong>INTERVENTION</strong></td>
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<td></td>
</tr>
<tr>
<td>83% ↑ 86% ↓ 83%</td>
<td>85% ↑ 87% ↓ 85%</td>
<td>70% ↑ 82% ↓ 78%</td>
<td>76% ↑ 82% ↓ 79%</td>
<td></td>
</tr>
</tbody>
</table>
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.

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.
Thank You

Questions?
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