NIOSH Disaster Science Research Initiative to Enhance Responder Safety and Health

Enabling Public Health Research During Disasters

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Natcher Conference Center
National Institutes of Health

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Centers for Disease Control and Prevention
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Occupational Safety and Health Act

To assure safe and healthful working conditions for working men and women.
NIOSH: Statutory Authorities

- Occupational Safety and Health Act of 1970
- Mine Safety and Health Amendments Act of 1977
  - MINER Act of 2006
- Energy Employees Occupational Illness Compensation Program Act of 2000
- The Zadroga 9/11 Health and Compensation Act of 2010
Intramural Disaster Science Research


Extramural Disaster Science Research

- Over $100 million awarded
  - Investigator-Initiated
  - Request for Applications

- All disaster science topics relating to responder safety and health
Emergency Responder Health Monitoring & Surveillance System

- Cover systematically all phases (pre-deployment, during deployment, and post-deployment)

- Ensure only qualified, trained, and properly equipped personnel (employees, contractors, and volunteers) are selected for deployment

- Ensure all receive sufficient health and exposure monitoring

- Determine whether longer-term monitoring or surveillance is needed

- Address longer-term health effects of responders
ERHMS: A Comprehensive Approach

DEPLOYMENT PHASE
- On-site Responder
- Exposure Assessments
- HASP Development and Controls Monitoring
- Health Monitoring and Surveillance
- Site Specific Orientation Training

PRE-DEPLOYMENT PHASE
- Health Screening/Immunizations
- Rostering and Credentialing
- Training and Preparedness

POST-DEPLOYMENT PHASE
- Exit Interview/Survey
- Long-term Health Tracking
- After Action Assessment

Post-deployment Health Tracking Decision
• Approved by the National Response Team (17 Federal agencies)

• Target audience: Incident commanders, emergency managers, agency heads

• NRT Technical Assistance Document (TAD)

• Available at: ERHMS.nrt.org and www.cdc.gov/niosh/topics/erhms
Disaster Science Research Initiative to Enhance Responder Safety and Health

- NIOSH launched the initiative in January 2014

- Hosted by NIOSH Office of Emergency Preparedness and Response

- Focus on developing a framework for an approach to timely, scalable, scientifically sound research

- Allows for research to be started quickly at the beginning, during and after the response to a large scale disaster.
Some DSRI Research Questions

- What are the *primary questions* needing research considering the possible types of responses and the responders involved?

- Where are the *major gaps* in our understanding of exposures and other factors influencing responder health?

- What are the *major barriers* to disaster science research to enhance responder safety and health?

- How does disaster research to ensure responder safety and health *best fit* into existing national response policies and systems?
Some DSRI Lines of Investigation

- Responder Demographic Ascertainment
- Exposure Assessment
  - Direct Reading and Sensor Technology
  - Real Time, Continuous Air Monitoring
  - Bio-monitoring
  - Analytics
- PPE Use and Effectiveness
- Responder Mental Health and Resiliency
Exposure Science & Quantified Responder

- **Work environment**
  - Direct-reading instruments
  - Personal Dust Monitor
  - Explosibility Meter

- **Biologic environment**
  - Biomarkers of exposure
  - Biomarkers of effect
  - In-dwelling monitors enabled by nanosensors that circulate sending data back to a central database
Biological Monitoring

- Determining when biological monitoring should be conducted can be difficult:
  - May not be clear whether a **scientific rationale** exists for biological monitoring in a given situation, or whether the monitoring results can provide meaningful and/or reliable information regarding health impact.
  - How such information would **ultimately benefit the worker**, a fundamental tenet in the decision to recommend biological monitoring for public health investigations, as opposed to research studies.
Personal Protective Equipment

- Research during a response is needed to better understand
  - Effectiveness of PPE used during a response
  - What steps can be taken to improve PPE effectiveness
  - Selection and use of appropriate PPE
  - Parameters that determine PPE usage by responders
  - Ways to minimize barriers to PPE usage
Longer Term Health Studies?

- On the basis of clear, pre-event scientific criteria, the need for longer-term studies should be assessed *early* in the course of the event by a panel of independent scientists.

- Initial criteria should then be *periodically revisited* because worker job activities, safety hazards, exposures and response events may change significantly during the course of the event.

- NIOSH framework for decision-making about when to do longer term studies:
What is Responder Resilience?

- Ability to rapidly adjust to adversity without physiological or psychological adverse effect
- Tied to mission success and productivity
- An element of organizational culture
- An integral component of health and safety

Reissman, Kowalski-Trakofler & Katz, 2011 (Resilience and Mental Health)
Reissman, Schreiber, Shultz, & Ursano, 2008 (Disaster Medicine)
Towards a Disaster Resilient Nation

- Provide disaster information when and where it is needed
- Understand processes that produce hazards
- Develop strategies and technologies to reduce the impact of extreme events on the built environment and vulnerable ecosystems
- Reduce vulnerability of infrastructure
- Develop ways to measure disaster resilience
- Promote risk-wise behavior
Occupational Safety and Health Administration

- Emergency Response and Preparedness

- Notice of Stakeholder Meeting
  - OSHA invites interested parties to participate in an informal stakeholder meeting on emergency response and preparedness. OSHA plans to use the information obtained at the stakeholder meeting as it considers the development of a proposed standard for emergency response and preparedness.

- July 30, 2014, at 9:00 a.m., Frances Perkins Building, Washington, DC.
DSRI Partnerships

NIOSH invites partner participation in the *Disaster Science Research Initiative* by all those interested in ensuring the safety and health of responders before, during, and after a disaster through research.

For more information on DSRI or to participate in this research:

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or

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