NIOSH Disaster Science Research Initiative to Enhance Responder Safety and Health

Board of Scientific Counselors Meeting
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Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

CDC Workplace Safety and Health

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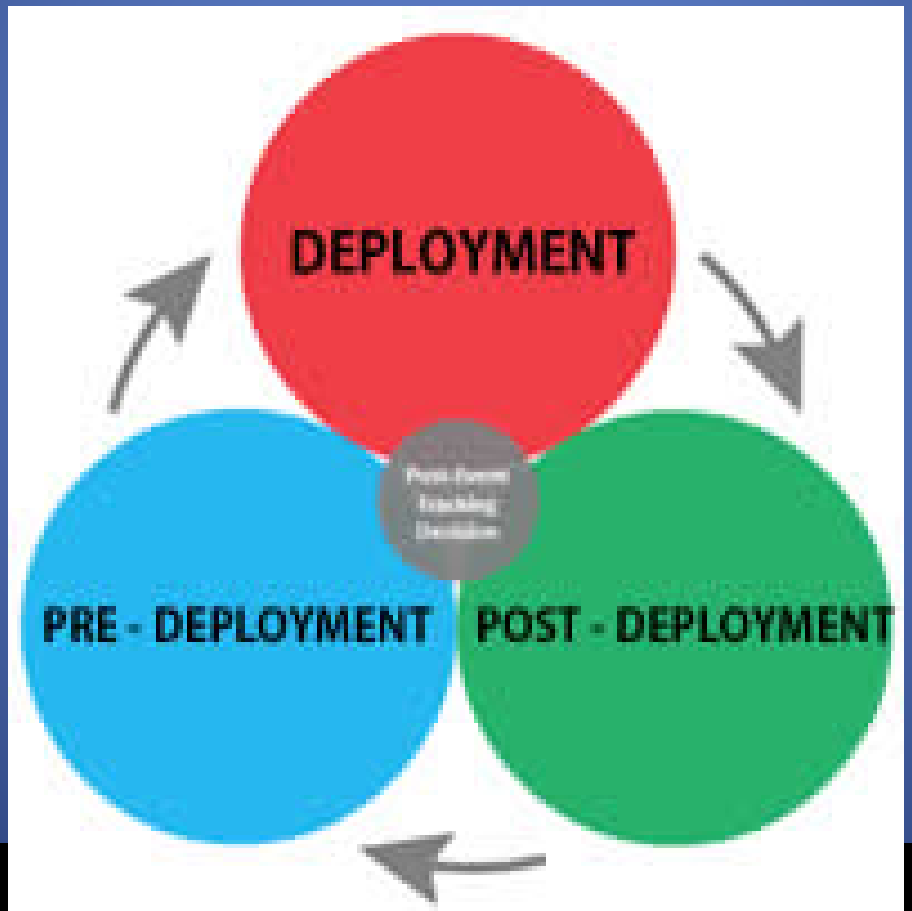
Emergency Responder Health Monitoring and Surveillance (ERHMS)

http://www.cdc.gov/niosh/topics/erhms/



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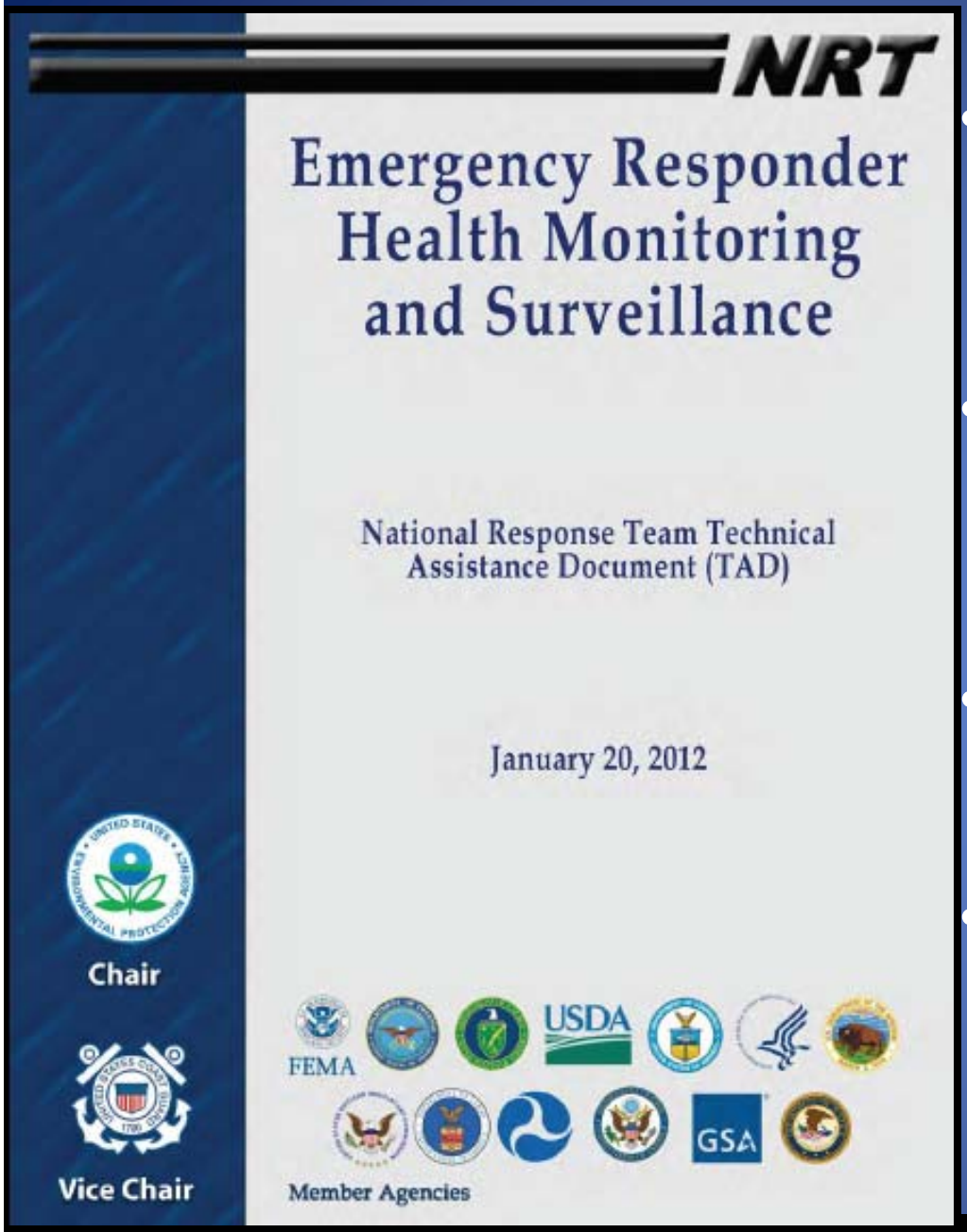

- Approved by the National Response Team (17 Federal agencies)
- Target audience: Incident commanders, emergency managers, agency heads
- NRT Technical Assistance Document (TAD)
- Available at: ERHMS.nrt.org and www.cdc.gov/niosh/topics/erhms

ERHMS

- Cover systematically all phases (pre-deployment, during deployment, and post-deployment)
- Ensure only qualified, trained, and properly equipped personnel are selected for deployment
- Ensure all receive sufficient health and exposure monitoring
- Determine whether long-term monitoring or surveillance is needed
- Address long-term health effects of responders

Longer-Term Health Studies: Need

- Factors that can affect the need, value, and feasibility include:
  - Uniqueness and magnitude of the event
  - Ability to clearly define the exposed population and an appropriate comparison population
  - Pre-identified areas of research interest
  - Potential chronic effects
  - Unique vulnerability of a worker population, and toxicological properties of the involved materials

Longer Term Health Studies: Decision-Making

- 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 events may change significantly during the course of the event

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 would such information ultimately benefit the worker, a fundamental tenet in the decision to recommend biological monitoring for public health investigations, as opposed to research studies

Biological Monitoring

- A decision matrix, used early in a response could help answer questions about:
  - Purpose of bio-monitoring and how results will be used
  - Likelihood and impact of dermal and respiratory exposures that are not easily assessed by traditional industrial hygiene methods
  - Efficacy of personal protective equipment
  - Health risk associated with exposure(s)
  - Consideration of future health outcomes
  - Existence of feasible biomarkers

NIOSH Science From DWH Response

- Kitt MM et al. Protecting workers in large-scale emergency responses: NIOSH experience in the Deepwater Horizon response. *JOEM* 2012;53(7):711-718.
- King BS & Gibbons JD. Health hazard evaluation of Deepwater Horizon response workers. *NIOSH*, August 2011 http://www.cdc.gov/niosh/hhe/reports/pdfs/2010-0115-0129-3138.pdf
- Michaels D & Howard J. Review of the OSHA-NIOSH response to the Deepwater Horizon oil spill: protecting the health and safety of cleanup workers. *PLoS Currents: Disasters* 2012; July 18 http://currents.plos.org/disasters?s=Deepwater+Horizon
- Decker JA et al. Recommendations for biomonitoring of emergency responders: focus on occupational health investigations and occupational health research. *Military Medicine* 2013; 178(1): 68-75(8)
- Decker JA et al. A decision process for determining whether to conduct responder health research following large disasters. *American Journal of Disaster Medicine* 2013; 8(1):252-33

NIOSH Launches DSRI

- 2002
  - Established the *Emergency Preparedness and Response Program* to advance scientific research in the area of responder safety and health
  - Leader in the field of disaster science research for professional responders
- 2006
  - Established the Emergency Preparedness and Response Cross Sector program and developed strategic goals to guide its research and partnership efforts.
- 2014
  - DSRI will concentrate on developing an approach to timely, scalable, scientifically sound responder-based research that can feasibly be implemented before, during, and after a large-scale disaster
  - NIOSH is the only Federal agency charged by Congress to conduct worker safety and health research

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?

- What research is NIOSH uniquely positioned to do and what is the role of the academic community in responder safety and health research?

DSRI Research Questions

- What is the role of emergency preparedness and response practitioners and consultants in responder safety and health research?

- What role should bio-monitoring play and how is it best implemented?

- How can ERHMS best be used to complement responder disaster research?

- How does responder disaster research best fit into existing national response policies and systems?

Examples of Research Needs

- Exposure Science
- Mental Health and Resiliency
- Personal Protective Equipment Use and Effectiveness

Exposure Science

- Work environment
  - Direct-reading instruments
  - Personal Dust Monitor
- Biologic environment
  - Biomarkers
  - In-dwelling monitors enabled by nanosensors that circulate sending data back to a central database

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)

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

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:

CAPT Margaret Kitt at ajy8@cdc.gov

or

CDR Lisa Delaney at lkd2@cdc.gov

DSRI Topic Page:

http://www.cdc.gov/niosh/topics/disasterscience/default.html

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Disaster Science Research Initiative to Enhance Responder Safety and Health

NIOSH developed the Disaster Science Research Initiative (DSRI) to enhance the safety and health of emergency responders

NIOSH staff member interviews responders during the Deepwater Horizon Oil Spill Response

The DSRI will expand our understanding of how to conduct timely, scalable, scientifically sound research focused on the safety and health of responders. The goal is to develop a framework that allows for research to be started quickly in the time before, during, and after response to a large scale disaster.

Scientific study can provide better understanding and reduction of responder health effects from disasters and can lead to improvements in the effectiveness of emergency responses. NIOSH invites partner participation in DSRI by all those interested in ensuring the safety and health of responders in a disaster through research.

Background

Contact Us:

National Institute for Occupational Safety and Health (NIOSH)
Centers for Disease Control and Prevention
800-CDC-INFO
(800-232-4636)
TTY:
(888) 232-6348
New Hours of Operation
8am-8pm ET/Monday-Friday
Closed Holidays
Contact CDC-INFO

Next Steps

- Communicate with list serve of those who have expressed interest in this discussion
- July invited workshop of non-Federal partners to discuss:
  - What disaster science research is most needed and feasible to address responder safety and health risks and exposures
  - The most appropriate role(s) for NIOSH and the extramural community to maximize resource utilization and expertise in the field of disaster science research
- Possible town hall meeting in the fall 2014/spring 2015
- Develop a plan for extramural engagement

BSC Input

- What additional research is needed?
- The role(s) for NIOSH and the extramural OSH community in this effort?
- How to best garner support from the responder community?

Thank You!