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## Utilizing the Emergency Responder Health Monitoring and Surveillance System to Prepare for and Respond to Emergencies

**Editor's Note:** NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature a column from the Environmental Health Services Branch (EHSB) of the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, EHSB and guest authors share insights and information about environmental health programs, trends, issues, and resources. The conclusions in this column are those of the author(s) and do not necessarily represent the official position of CDC.

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During the World Trade Center attack on September 11, 2001, hundreds of thousands of people were exposed to environmental contaminants and traumatic injuries, and nearly 3,000 people lost their lives (Lucchini et al., 2017). As workers from every U.S. state rushed in to help those affected, there was minimal health tracking of workers and records of what they were exposed to or what type of personal protective equipment they may have been wearing early in the response. As a result, 450 workers died and hundreds more were seriously injured (Jackson et al., 2002).

In order to ensure workers can respond safely and effectively to future emergencies, the National Institute for Occupational Safety and Health (NIOSH) collaborated with federal agencies, state health departments, and

unions to create the Emergency Responder Health Monitoring and Surveillance (ERHMS) System. ERHMS is a framework that allows an organization to monitor the health and safety of emergency responders throughout the predeployment, deployment, and post-deployment phases of a response. The goal of ERHMS is to prevent short- and long-term illness and injury in emergency responders. Traditional groups of workers that typically respond to emergencies include police, fire, emergency medical personnel, and construction and utility workers, but can also include environmental health specialists, industrial hygienists, mental health professionals, and other public health personnel and volunteers.

There are well documented gaps and deficiencies in the health monitoring and surveillance of emergency response workers in

reports following the 9/11 terrorist attacks (Jackson, Baker, Ridgeley, Bartis, & Linn, 2004), but unfortunately, these trends have continued during the responses to Hurricanes Katrina and Rita (Bergan, Thomas, Schwartz, McKibbin, & Rusiecki, 2015; Rusiecki et al., 2014) and Deepwater Horizon (Kitt et al., 2011; National Institute for Occupational Safety and Health, 2011).

ERHMS aims to ensure specific activities to protect the health and safety of emergency response and recovery workers are conducted during each of the three phases of a response (Figure 1). During the predeployment phase, organizations should ensure workers are properly rostered, credentialed and trained; fit for duty; and can store this information in a secure manner. During the deployment phase, health monitoring and surveillance should be conducted while workers perform their job tasks to ensure there are no exposures. This monitoring includes making sure workers have access to potable water, safe food, and secure housing. During the postdeployment phase, workers should be properly demobilized and it should be determined if long-term tracking is needed. After action meetings should be conducted and lessons learned documented to continually improve future responses. The guidance for how to implement these activities and specific tools that can be utilized during each phase of the response can be found in the National Response Team (NRT) Technical Assistance Document (NRT, 2012).

There is evidence that ERHMS can be implemented by organizations. For example, during the 2014 Ebola outbreak, NIOSH

FIGURE 1

**Three Phases of the Emergency Responder Health Monitoring and Surveillance System**



**For More Information**

- Visit the Emergency Responder Health Monitoring and Surveillance (ERHMS) website at [www.cdc.gov/niosh/erhms](http://www.cdc.gov/niosh/erhms)
  - View ERHMS training opportunities
  - Access software, the user manual, and training videos
- E-mail us at [erhmsonline@cdc.gov](mailto:erhmsonline@cdc.gov)
  - Request in-person ERHMS training
  - Ask questions about the program

assisted the Centers for Disease Control and Prevention (CDC) with expanding its Responder Readiness Program by implementing the ERHMS framework into their response structure. Specifically, a pre-deployment coordinator position was established to work with responders before they deployed to ensure they met all the health requirements and were properly trained. Several NIOSH staff served as safety officers in affected countries in order to conduct health and safety monitoring of staff during the deployment phase. Finally, a postdeployment coordinator position was created to determine if any long-term monitoring should be conducted, including any mental health needs.

In 2016, as Hurricane Matthew was fast approaching, the Georgia Department of Public Health (DPH) adapted their existing Responder Safety, Tracking, and Resilience

(R-STAR) System to incorporate ERHMS. DPH staff sent out surveys to responders to self-register their deployment activities and to complete a health and safety check. According to Funk (2017), feedback from participants indicated responders valued someone checking in on them during their deployment and supervisors could verify their responders were accounted for and unharmed. By incorporating ERHMS, DPH would be able to meet Capability 14 (responder safety and health) as part of its CDC Public Health Emergency Preparedness cooperative agreement (CDC, 2011). Any state receiving this funding can implement ERHMS by completing tasks in Capability 14 or 15 (volunteer management).

In order to increase an organizations' ability to implement and adopt ERHMS, NIOSH has recently developed ERHMS Info Manager,

a free, custom-built software product that uses Epi Info for all calculations and analyses. This product allows for the collection of data as outlined in ERHMS throughout all three phases of a response. For example, ERHMS Info Manager will allow users to manage staff readiness by collecting information on rostering, training, and medical screening, thus improving organization preparedness prior to an emergency. NIOSH has also developed a user manual and training videos to accompany the software and has partnered with Epi Info to ensure technical support is available to all users. In addition, NIOSH has free training on ERHMS available online and in-person. Continuing education credits are available for these trainings.

With an increase in emerging threats over the past several years and a high demand for environmental public health and safety professionals to respond, it is imperative that we continue to train our workers to prepare for and respond to emergencies. Without a trained, well-equipped, and healthy workforce, we cannot overcome future threats. 🚒

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**References**

Bergan, T., Thomas, D., Schwartz, E., McKibben, J., & Rusiecki, J. (2015). Sleep deprivation and adverse health effects in United States Coast Guard responders to Hurri-

- canes Katrina and Rita. *Sleep Health*, 1(4), 268–274.
- Centers for Disease Control and Prevention. (2011). *Public health preparedness capabilities: National standards for state and local planning*. Retrieved from [https://www.cdc.gov/phpr/readiness/00\\_docs/DSLRC\\_capabilities\\_July.pdf](https://www.cdc.gov/phpr/readiness/00_docs/DSLRC_capabilities_July.pdf)
- Funk, R. (2017). Applications: Responder safety. In J.A. Horney (Ed.), *Disaster epidemiology: Methods and applications* (1st ed.). Cambridge, MA: Academic Press.
- Jackson, B.A., Baker, J.C., Ridgely, M.S., Bartis, J.T., & Linn, H.I. (2004). *Protecting emergency responders: Safety management in disaster and terrorism response* (Vol. 3). Cincinnati, OH: National Institute for Occupational Safety and Health.
- Jackson, B.A., Peterson, D.J., Bartis, J.T., LaTourrette, T., Brahmakulam, I., Houser, A., & Sollinger, J. (2002). *Protecting emergency responders: Lessons learned from terrorist attacks*. Santa Monica, CA: RAND.
- Kitt, M.M., Decker, J.A., Delaney, L., Funk, R., Halpin, J., Tepper, A., . . . Howard, J. (2011). Protecting workers in large-scale emergency responses: NIOSH experience in the Deepwater Horizon Response. *Journal of Occupational and Environmental Medicine*, 53(7), 711–715.
- Lucchini, R., Hashim, D., Acquilla, S., Basanets, A., Bertazzi, P.A., Bushmanov, A., . . . Todd, A. (2017). A comparative assessment of major international disasters: The need for exposure assessment, systematic emergency preparedness, and lifetime health care. *BMC Public Health*, 17(46), 1–12.
- National Institute for Occupational Safety and Health. (2011). *Lessons learned from the Deepwater Horizon response* (DHHS [NIOSH] Publication No. 2012-117). Cincinnati, OH: U.S. Government Printing Office.
- National Response Team. (2012). *Emergency responder health monitoring and surveillance: National Response Team technical assistance document (TAD)*. Retrieved from [https://www.nrt.org/sites/2/files/ERHMS\\_Final\\_060512.pdf](https://www.nrt.org/sites/2/files/ERHMS_Final_060512.pdf)
- Rusiecki, J.A., Thomas, D.L., Chen, L., Funk, R., McKibben, J., & Dayton, M.R. (2014). Disaster-related exposures and health effects among US Coast Guard responders to Hurricanes Katrina and Rita: A cross-sectional study. *Journal of Occupational and Environmental Medicine*, 56(8), 820–833.

## Did You Know?

NEHA is partnering with the U.S. Department of Housing and Urban Development (HUD) and the Office of Lead Hazard Control and Healthy Homes for the NEHA 2018 AEC and HUD Healthy Homes Conference. Learn more at [www.neha.org/aec](http://www.neha.org/aec).



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