

Disasters—Keeping Volunteers, Workers, and Responders Safe

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CDC EPIC Webinar

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National Institute for Occupational Safety and Health (NIOSH)



NIOSH Staff: ~ 1,200

**Vision: Safer, Healthier
Workers**

Why Include Occupational Safety and Health in an Emergency?

At every disaster, chemical release, infectious disease outbreak, radiological or terrorist event . . .

There are workers who are at potential risk.



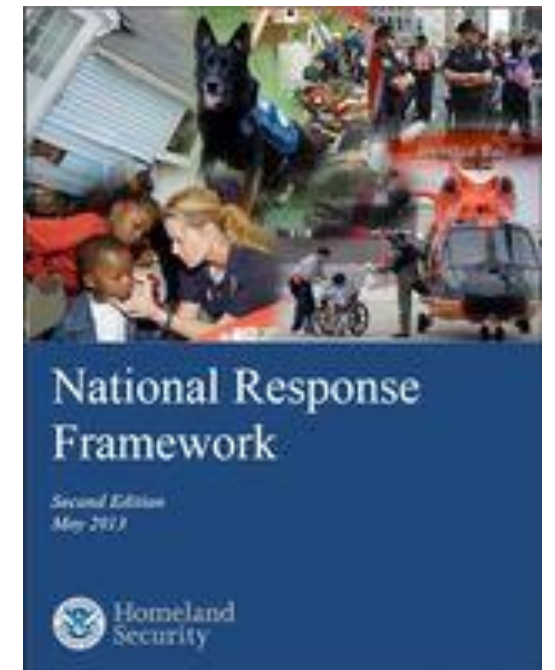
Needs of All Response and Recovery Workers Require Attention

- Depending on the type of emergency, different workers will be affected
 - Healthcare workers
 - Transportation workers
 - Clean-up workers
 - Utility workers
 - Animal care workers
 - Construction workers
 - And many more.....

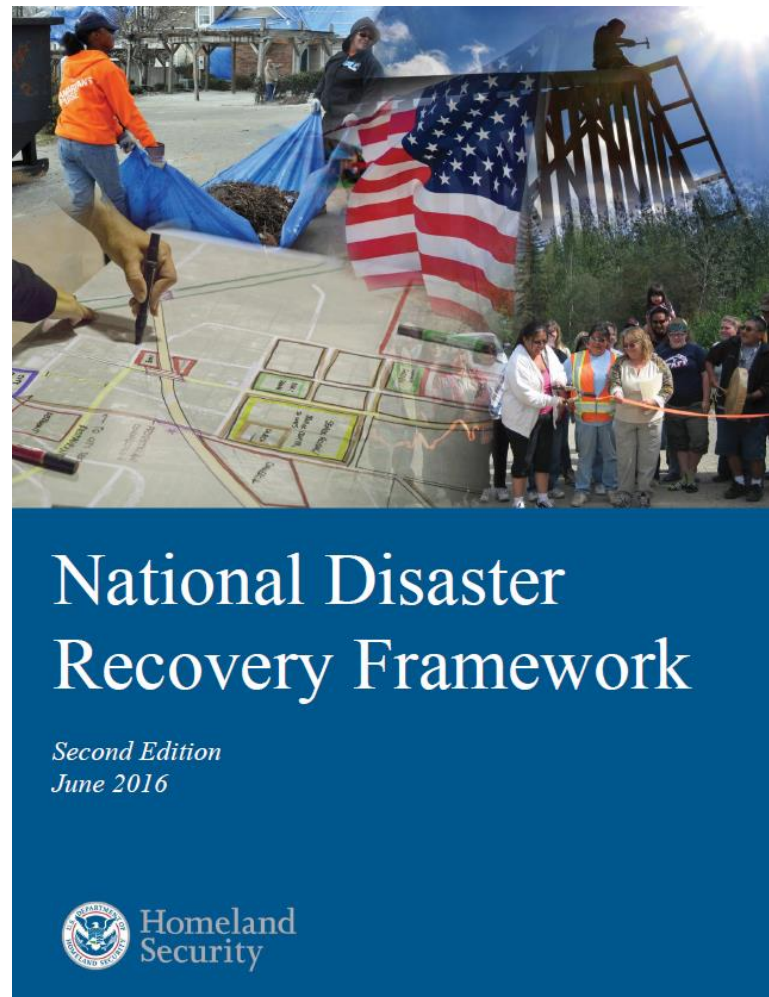


Worker Safety and Health Support Annex

- Provides federal support to federal, state, tribal, and local response and recovery organizations in assuring worker safety and health during incidents requiring a coordinated federal response
- Led by the Occupational Safety and Health Administration (OSHA)
- Supporting agencies:
 - NIOSH, ATSDR, NIEHS, DOD/USACE, Coast Guard, FEMA, DOE, and EPA

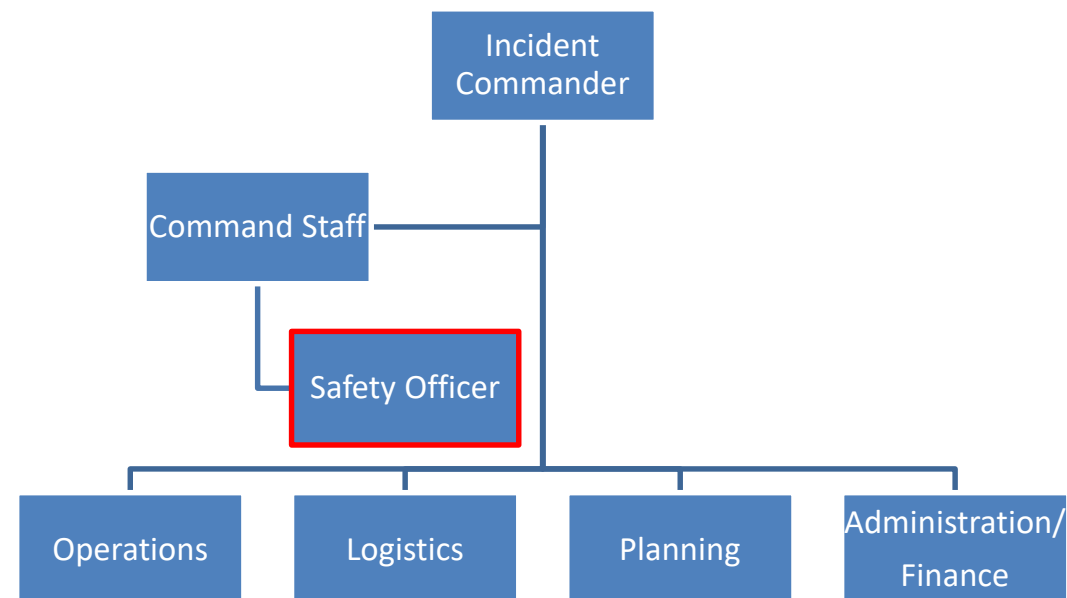


Recovery Core Mission Areas



ICS Key to a Safe Response Is the Safety Officer

- Assures personnel safety and monitors hazardous and unsafe situations
- Prepares a site-specific safety and health plan



Potential Hazards

- Stress
- Physical
- Biological
- Chemical
- Thermal
- Radiation
- Violence



Stress

- Experience range of stressors during a response
- Immediate or delayed response
- Symptoms:
 - Physical (fatigue, nausea, headache)
 - Cognitive (confusion, poor concentration)
 - Emotional (anxiety, guilt, depression)
 - Behavioral (intense anger, withdrawal)

Emotional Well-Being and Resiliency

- Pace yourself.
- Take frequent rest breaks.
- Watch out for each other.
- Do something you enjoy.
- Rest, sleep, eat, and be active.

Debris Piles/Unstable Surfaces

- Only walk on surfaces you know are stable.
- Watch for sharp edges and points.
- Wear protective equipment (e.g., safety shoes with slip-resistant soles, hard hat, and leather gloves).
- Beware of trench collapses and cave-ins.



Structural Integrity



- Do not enter questionable structures until they are evaluated and rendered safe.
- Conduct all necessary activities from outside damaged structures.
- Ensure structures are evaluated by a competent person.

Injury from Dust & Flying Debris

- Be alert to the hazards from nearby workers, machinery, and falling/shifting debris.
- Wear safety glasses with side shields.
- Consider wearing goggles for protection against dust particles or for use over prescription glasses.
- Wear hard hats, safety shoes, and work gloves.



Utilities Hazards

- Treat all power lines and cables as energized until proven otherwise.
- Stay clear of downed electrical lines.
- Gas lines, water pipes, sewer lines, and other utilities may also be compromised.



Exposure to High Noise Levels

- A worksite is considered noisy if you have to shout to be heard.
- High noise levels are generated from gas-powered saws, pneumatic tools, and heavy construction equipment.
- Wear appropriate hearing protection in noisy work environments.



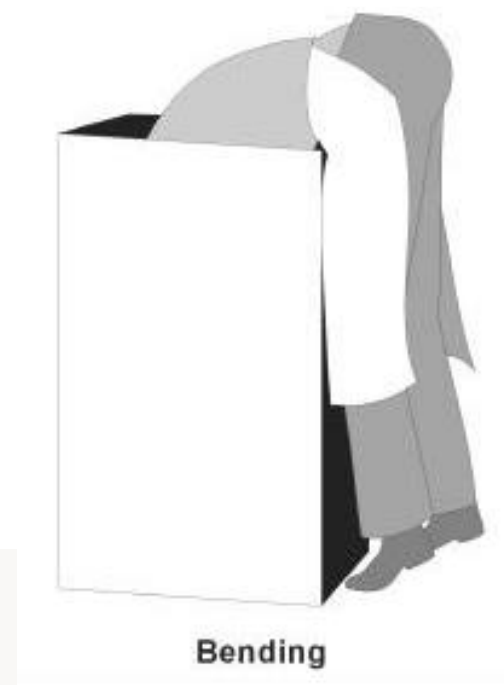
Slips, Trips, and Falls

- Can be caused by
 - Wet or slippery surfaces
 - Improper footwear
 - Poor lighting
 - Obstacles in pathway
 - Ladders
 - Changes in elevation or uneven surfaces (curbs, cracks, ramps, single steps, stairs)



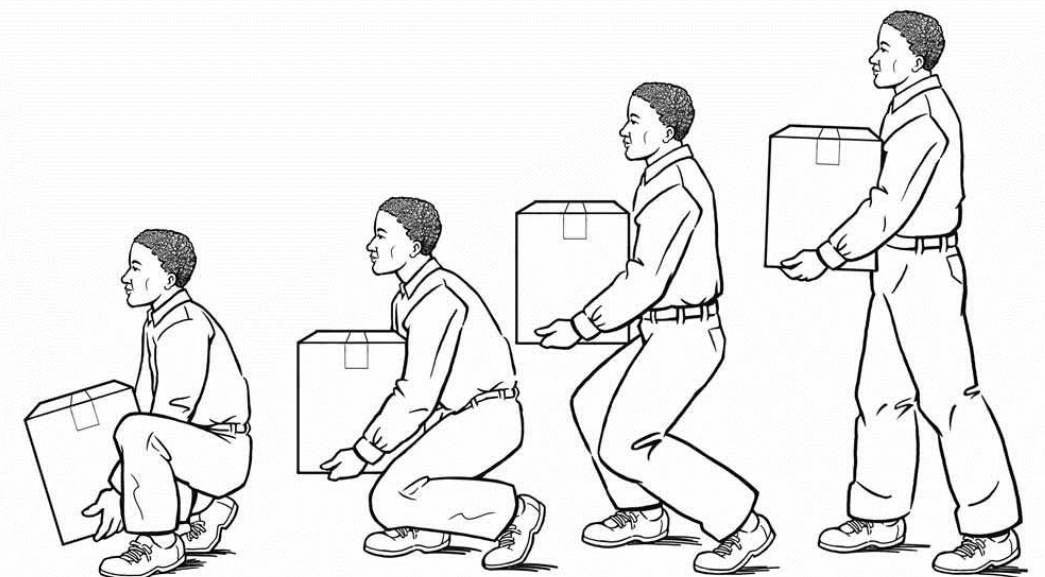
Musculoskeletal Disorders

- Muscle strain, local fatigue, pain, or discomfort to the body caused by:
 - Frequent heavy lifting
 - Bending
 - Twisting
 - Kneeling
 - Repetitive tasks



Ergonomic Solutions

- Improve design of work stations.
- Don't lift and carry more than 50 pounds alone.
- Minimize duration of repetitive motions and awkward postures.
- Implement job rotation system.



Driving in Disaster Areas

- Use a seat belt at all times.
- Avoid distractions.
- Stay alert to situations requiring quick action.
- Watch for emergency vehicles.
- Watch for other drivers and flaggers.
- Avoid driving through floodwaters.



Confined Spaces

What is a confined space?

- Space with limited access
- Large enough for bodily entry
- Not designed for occupancy
- Examples: sewers, wells, storm drains, tanks, vats, boilers, silos, pits, tunnels

What are the hazards?

- Hazardous atmosphere
- Flammable/explosive gases, vapors, or mists
- Toxic substances
- Oxygen deficiency or surplus
- Entrapment
- Engulfment

AVOID CONFINED SPACES!

Bloodborne Pathogens

- Bloodborne pathogens: microorganisms such as viruses or bacteria that are carried in blood and can cause disease in people
- Infected blood can enter your system through
 - Open sores
 - Cuts
 - Abrasions
 - Acne
 - Any sort of damaged or broken skin such as sunburn or blisters
 - Mucous membranes (eyes, nose, mouth)



Bloodborne Pathogens

- Assume blood or bodily fluids potentially contaminated with blood are infectious.
- Wear personal protective equipment.
- Consider Hepatitis B vaccination.



Mold

- Flooded buildings promote mold growth
- Symptoms include sneezing, coughing, nasal/eye/skin irritation, and asthma-like symptoms
- Personal protective equipment is needed and depends on the amount of contamination and work activities



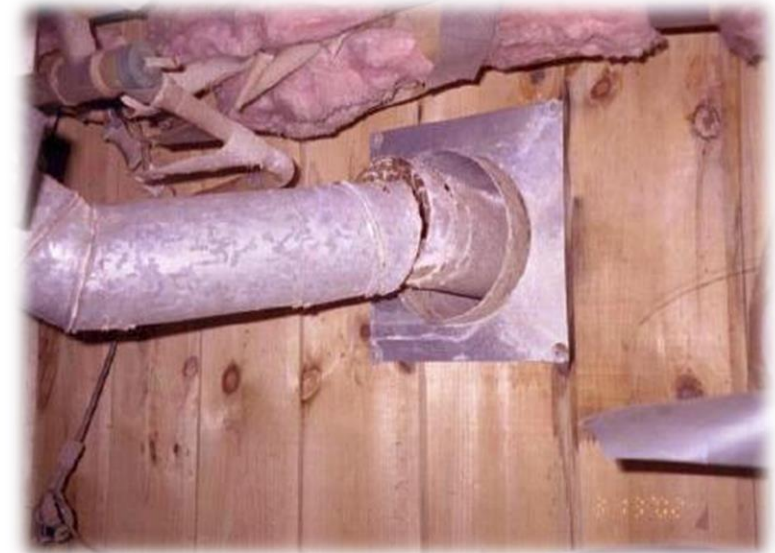
Foodborne Disease

- Practice hand hygiene before eating.
- Assure that your food is from a safe source.
- Identify and throw away any food that may not be safe to eat.
- Store food safely.
- Only drink from potable water sources proven to be safe.



Carbon Monoxide Poisoning

- Colorless, odorless, toxic gas
- Combustion fumes from
 - Cars, trucks, heavy machinery
 - Small gasoline-powered engines
 - Burning wood or charcoal
 - Temporary space heaters
 - Gas ranges, stoves & heating systems
- Symptoms include headache, dizziness, drowsiness, nausea, vomiting, loss of consciousness, collapse, coma, or death



Dust Containing Asbestos, Silica, and Other Particulates

- Dust may contain hazardous materials.
- Avoid dust-generating activities and wet area.
- Wear personal protective equipment.



Heat Stress

- Contributing conditions
 - High temperature and humidity
 - Direct sun or heat exposure
 - Physical exertion
 - Clothing (e.g., PPE)
 - Poor physical condition
- Heat-related disorders
 - Heat rash
 - Fainting
 - Heat cramps
 - Heat exhaustion
 - Heat stroke




Heat Stress Prevention


- Stay hydrated (1 cup water or sports drink every 20 minutes).
- Watch for signs and symptoms of heat-related illness.
- Reduce work load/adjust work schedule.
- Take frequent breaks in cool areas.
- Wear lightweight, light colored, loose-fitting clothes.
- Avoid alcohol, caffeinated drinks, or heavy meals.



NIOSH Resources






 Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

All A-Z Topics


SearchAll CDC▼

The National Institute for Occupational Safety and Health (NIOSH)




Emergency Preparedness and Response Program



Promoting productive workplaces through safety and health research




EMERGENCY PREPAREDNESS AND RESPONSE RESOURCES




Workers are a common denominator at any disaster or novel emergency event. Protecting the health and safety of these workers by preventing diseases, injuries, and fatalities is a NIOSH Emergency Preparedness and Response Program priority. This can be accomplished by ensuring that responder safety and health is addressed systemically during all phases (pre-, during-, and post-deployment) to make certain only qualified, trained, and properly equipped personnel are deployed. The topic areas below contain guidance to assist employers and responders to achieve the goal of worker safety and health during responses.

In addition, the NIOSH [Emergency Preparedness and Response Program Portfolio](#) is part of a research portfolio that sets the goals and develops plans for worker safety and health research advancement and collaborations.

 Get Email Updates

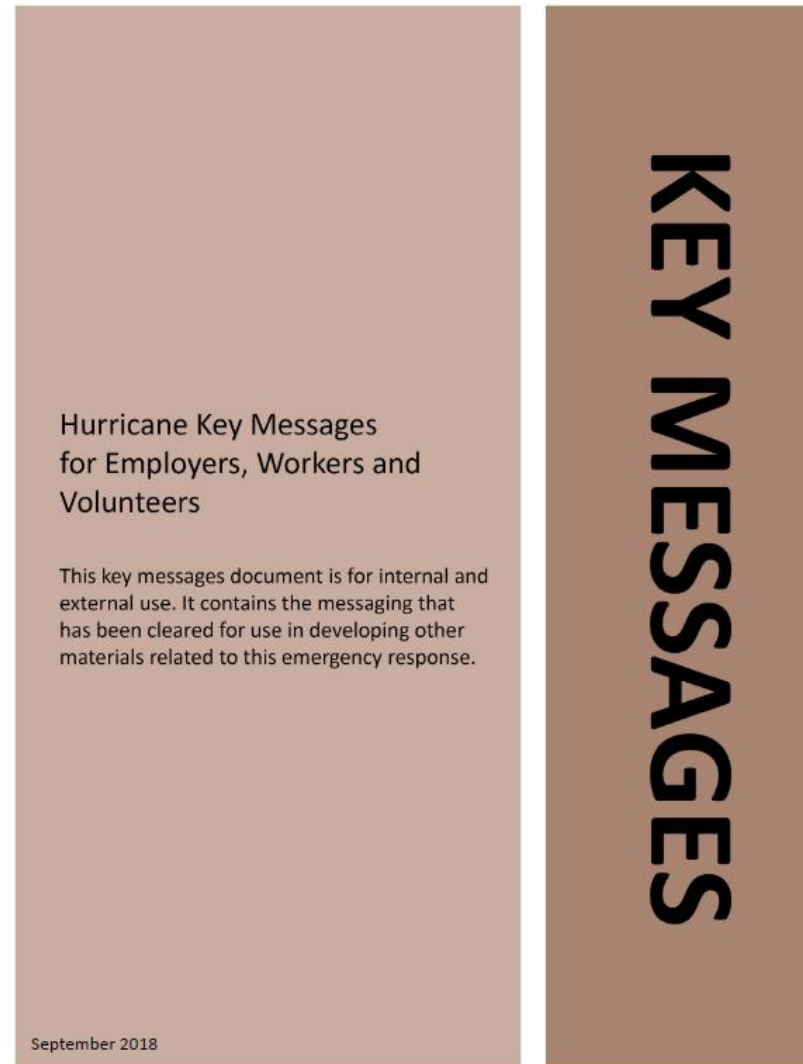
To get updates from the NIOSH Emergency

Featured Topic

 Help protect emergency responders! [FREE ONLINE TRAINING](#) for the Emergency Responder

www.cdc.gov/niosh/emres/

NIOSH Hurricane Key Messages



www.cdc.gov/niosh/topics/emres/pdfs/NIOSH-Emergency-Responder-Key-Messages.pdf

Emergency Responder Health Monitoring and Surveillance™ (ERHMS™)

- 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 long-term monitoring or surveillance is needed.



ERHMS™ Goal

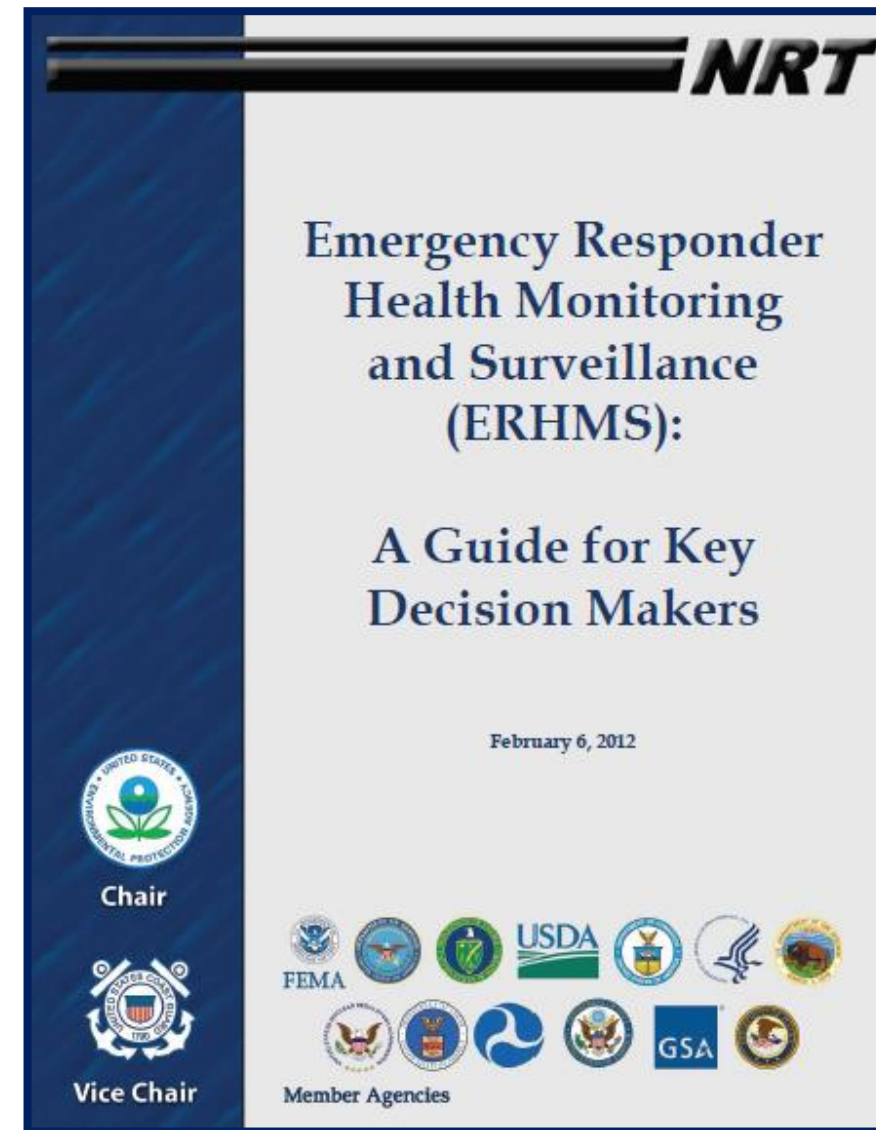
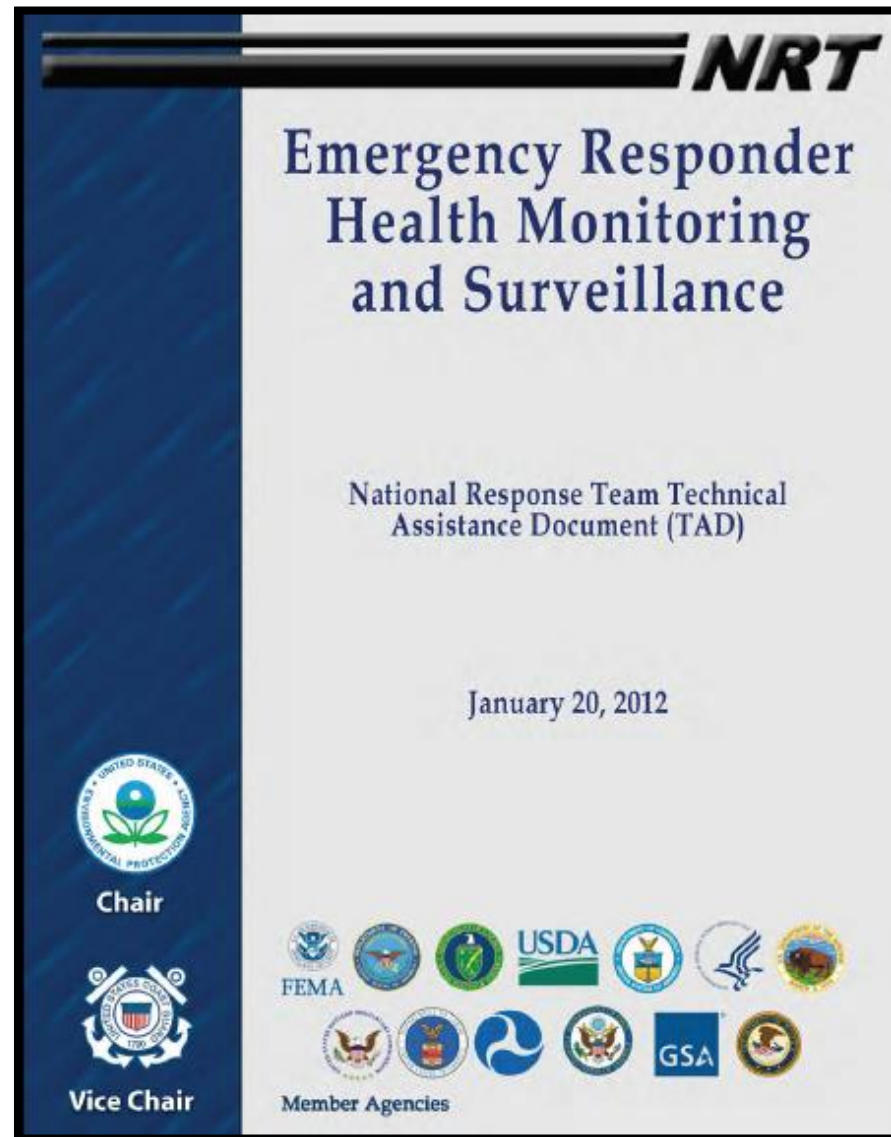
Develop a health monitoring and surveillance framework for the prevention of illness and injury to emergency responders, which addresses all phases of a response, including pre-deployment, deployment and post-deployment phases



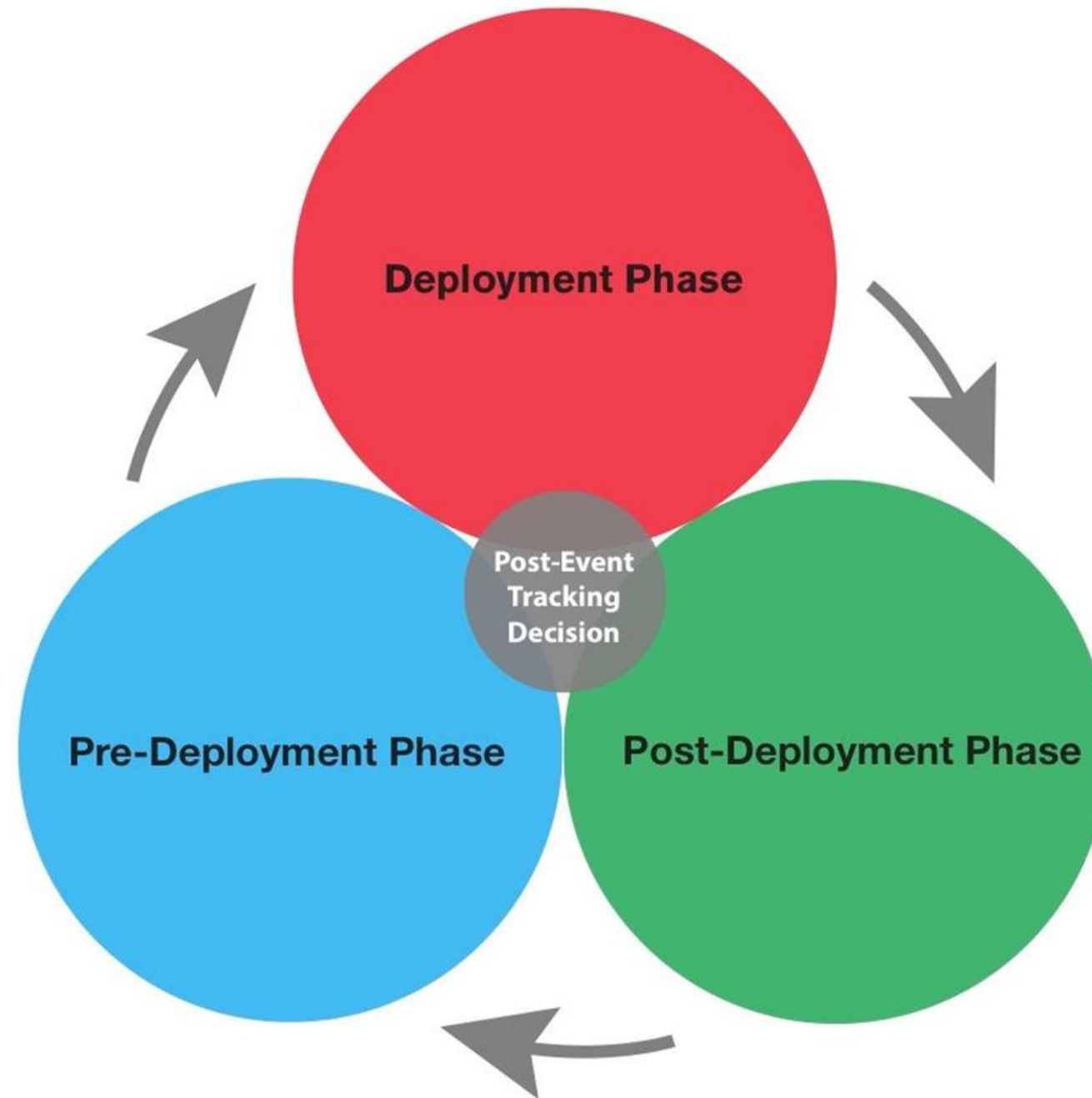
Prepared by an Interagency Work Group

- NIOSH (coordinator)
- Federal Agencies
 - Federal Emergency Management Agency
 - Occupational Safety and Health Administration
 - Health and Human Services
 - Environmental Protection Agency
 - Homeland Security Department (Coast Guard)
 - InterAgency Board
 - US Army Corps of Engineers
- State Health Departments
 - California
 - Oregon
- Volunteer Organization
 - American Red Cross
- Unions
 - International Association of Firefighters
 - Center to Protect Workers' Rights

Adopted by the National Response Team



Three-Phase System



Pre-Deployment Considerations

- Are responders ready to deploy — physically and mentally fit?
- Are responders qualified with the right training and licenses?
- Do responders have all the correct personal protective equipment, gear, immunizations?

ERHMS™ Pre-Deployment Overview

The pre-deployment phase emphasizes preparedness for response. During this phase the foundation is established for monitoring and surveillance during and after a response.



**Rostering and
Credentialing**



**Health Screening /
Immunizations**



**Health and Safety
Training**



**Data Management /
Information Security**

Deployment Considerations

- Which responders deployed and how are we keeping track of them?
- How are we monitoring their exposures, and how are we protecting them on-site when there are newly found exposures?
- How are we tracking their activities and their health and safety during the response?

ERHMS™ Deployment Overview

The deployment phase emphasizes tracking responders once on-site. Activities include monitoring and assessing health hazards during response work and then controlling hazards when identified.



**On-site Responder
In-processing**



**Health Monitoring
and
Surveillance**



**Exposure
Assessment,
Activities, and
Controls**



**Communication of
Exposure and
Health Data**

Post-Deployment Considerations

- What happens with data from the response?
- How do we make decisions about tracking responder health?
- When is tracking necessary?
- What can we learn from information gathered from the response to improve the next response?

ERHMS™ Post-Deployment Overview

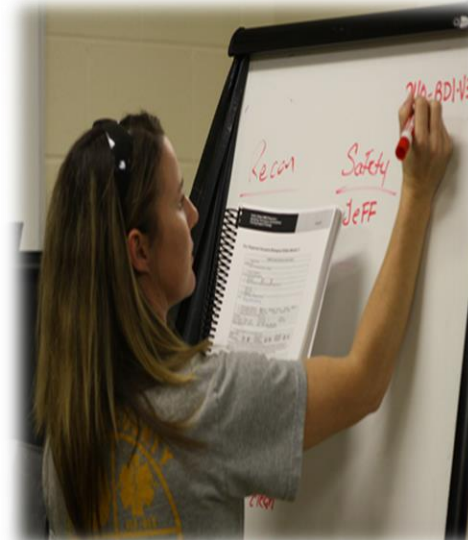
The post-deployment phase emphasizes recovery from response and establishes the process for ongoing long-term monitoring and surveillance of responder health after a response.



**Out-Processing
Assessment**



**Determination of
Need for Long-Term
Monitoring**

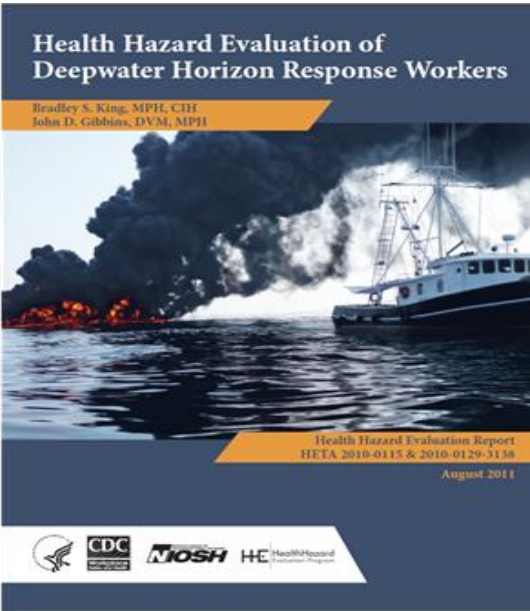
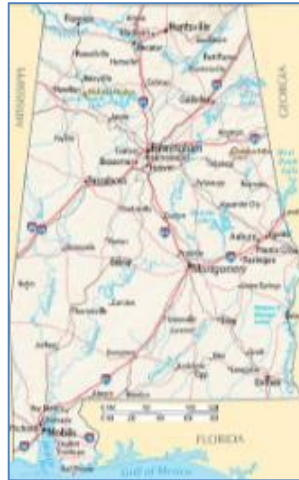


**After-Action
Reporting**

Examples of Implementation

- NIOSH Deepwater Horizon Response
- CDC Ebola Response
- GA Department of Public Health Hurricane Response
- OR Health Authority response to Roseburg Mass Shooting
- State and local exercises (WV and ID)

Deepwater Horizon Oil Spill Response, 2010



Paper & Electronic Records As of 10-1-10
Total Collected: 55,561

Targeted Workers
BP Staff
BP Contractors
Volunteers
Federal
State & Local

	Percentage
Male	81%
Female	19%
Asian	3%
Hispanic	8%
Black	36%
All Others	53%

Implementation of CDC ERHMS™ Unit

West Africa Ebola Outbreak, 2014

- Pre-deployment
 - Mental health screening
 - Health and safety briefings
 - Improved deployment role selection
- Deployment
 - In-country Safety Officer
 - Safety and security, medevac, surveillance, sanitation, resiliency and accountability
- Post-deployment
 - Individual and team debriefs
 - Resiliency
 - Active monitoring



Georgia Department of Public Health

Hurricanes Matthew and Irma, 2016–2017

- Developed Responder Safety, Tracking, and Resilience (R-StaR) system
 - Based on ERHMS™ framework
 - Uses web-based survey tool
 - Deployment phase collects data on duties, daily health checks
 - Allowed follow-up on exposures and injuries
 - Piloted during Hurricane Matthew
 - Expanded use during Hurricane Irma
 - Now includes all three phases of response



Credit: The Weather Channel

Oregon Health Authority

Roseburg Mass Shooting, 2015

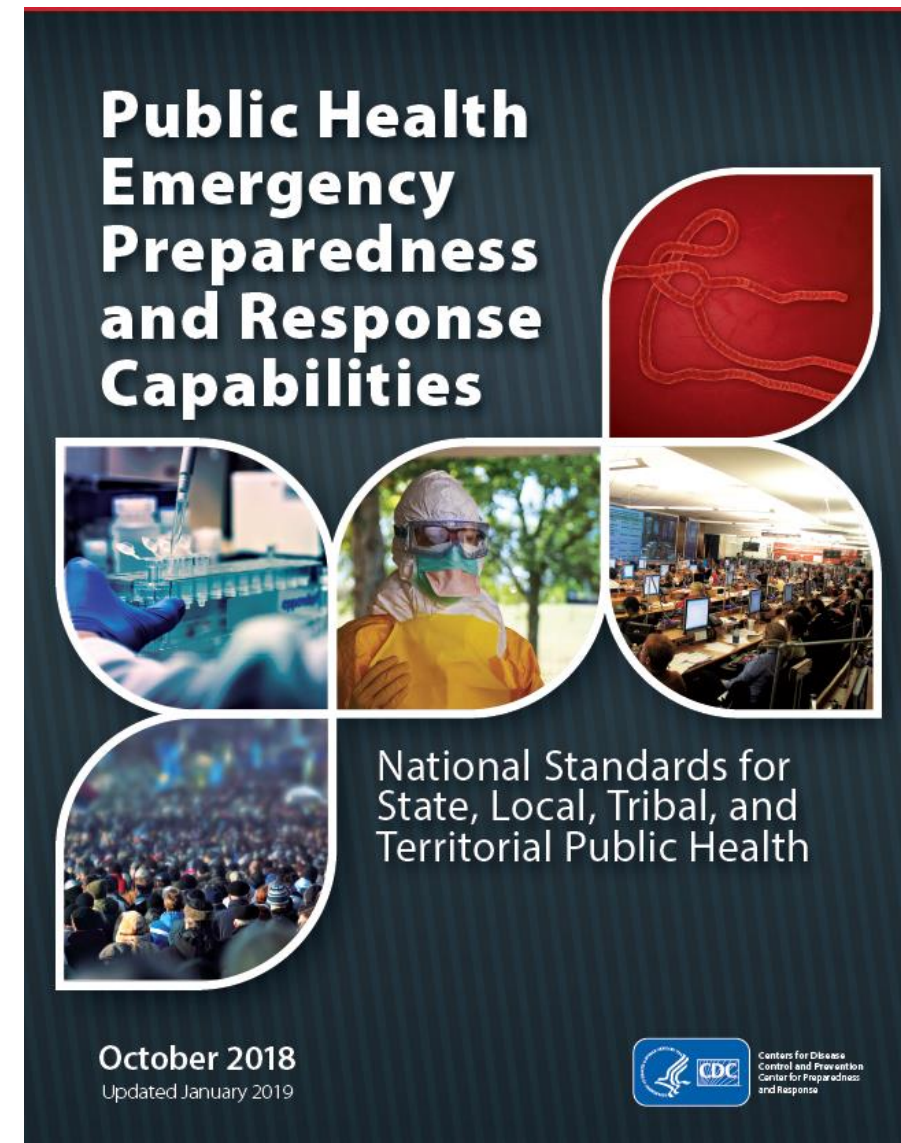
- State Emergency Registry of Volunteers in Oregon (SERV-OR) behavioral health clinicians
 - Pre-Deployment: review of credentials, screening, training
 - Deployment: caseload monitoring, communication
 - Post-Deployment: provider liaison support for transition, after-action debriefs
- Volunteers felt supported



Credit: Steve Dipaola/Reuters

CDC Public Health Emergency Preparedness (PHEP) Capabilities 14 and 15

- Incorporation of ERHMS™ framework and resources
- Promotion of future responder safety and health activities



ERHMS™ Training Opportunities

- CDC TRAIN WB2254: Emergency Responder Health Monitoring and Surveillance (ERHMS™): <http://cdc.train.org/DesktopModules/eLearning/CourseDetails/CourseDetailsForm.aspx?courseId=1045755>
- FEMA IS-930: Emergency Responder Health Monitoring and Surveillance (ERHMS™) Leadership Training: <http://training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=IS-930>
- CDC School of Preparedness & Emergency Response (SoPER) CDC-U-PER-0028: Emergency Responder Health Monitoring and Surveillance (ERHMS) course and in-person courses if available



- Free, custom-built software product to support implementation of the ERHMSTM framework
- Facilitates rapid assessment and intervention related to health monitoring and surveillance of emergency responders
- Developed for large and small agencies
- Pilot tested by nine state health departments
- Includes user manual and training videos

Intended Users

- Involved in the deployment and protection of emergency responders
- Providing incident management leadership
- Providing leadership to emergency organizations
- Associated with health, safety, and medical professionals

Thank you!

NIOSH EPR website: www.cdc.gov/niosh/programs/epr/default.html

ERHMS™ website: www.cdc.gov/niosh/erhms

Questions: erhmsonline@cdc.gov

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.