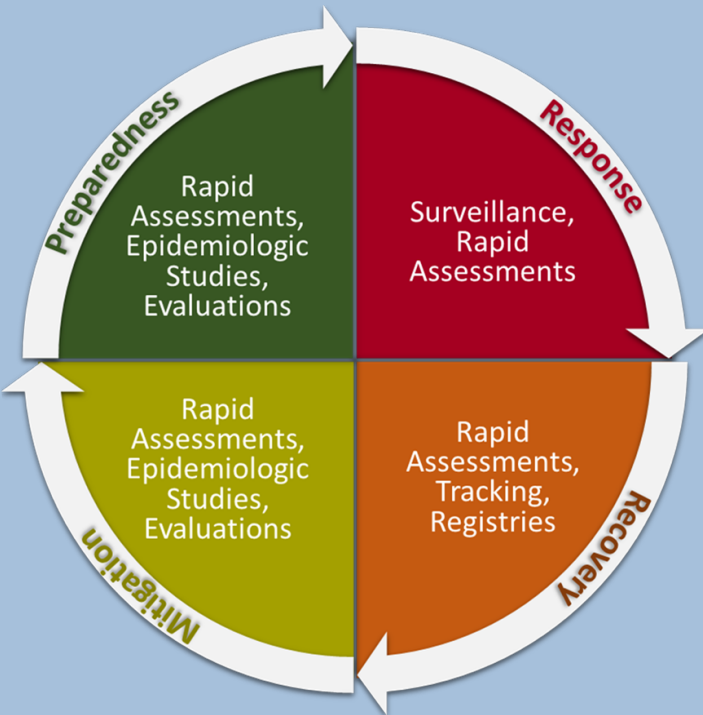


THE MAIN OBJECTIVES OF DISASTER EPIDEMIOLOGY ARE TO:



- Prevent or reduce the number of deaths, illnesses, injuries, and exposures caused by disasters and emergencies
- Provide timely and accurate information
- Improve prevention and mitigation strategies for future disasters and emergencies



DISASTER EPIDEMIOLOGY PROVIDES TIMELY, EVIDENCE-BASED SITUATIONAL AWARENESS TO DECISION MAKERS.

THINK DATA

DISASTER EPI

- Contains multiple tools and methods
- Applies in all phases of the **Emergency Management Cycle**
- Assesses community needs and status
- Identifies gaps and helps determine priorities
- Assists in response and recovery **resource allocation**
- Complies with the **National Incident Management System**
- Fits within Incident Command System
- Fulfills **Public Health Emergency Preparedness and Response** and Hospital Preparedness Program Capabilities
- Engages communities, non-governmental organizations, private sector partners, and government agencies





COMMUNITY ASSESSMENT FOR PUBLIC HEALTH EMERGENCY RESPONSE (CASPER)

CASPER

- Validated Rapid Needs Assessment method developed by the Centers for Disease Control and Prevention
- Provides household-level information in the area of interest
- Used in all four phases of the Emergency Management cycle
- Quick, reliable, low-cost, flexible, scalable
- Facilitates interagency collaboration and community engagement

STATISTICAL METHOD - 30X7 DESIGN

- **30** Census blocks ("clusters") selected from the area of interest ("sampling frame") of more than 800 households
- **7** household interviews conducted in each cluster
- **210** interviews generalized to the entire sampling frame

APPLICATIONS

- Determine critical needs of the community
- Assess preparedness, disaster impacts, health effects, etc.
- Provide situational awareness for decision-making
- Craft outreach messages
- Allocate resources and support requests for recovery funding
- Improve emergency plans
- Evaluate mitigation priorities or effectiveness of relief and recovery efforts



CASPER EXAMPLES

ALABAMA 2010, 2011, 2012

Topic: Mental Health consequences of Deepwater Horizon Oil Spill

Type: Response, Recovery

Data into Action: Obtained grants to increase mental health services in the affected communities

MICHIGAN 2012

Topic: Household emergency preparedness

Type: Preparedness

Data into Action: Informed local and state resource planning

CALIFORNIA 2015, 2016

Topic: Drought

Type: Response, Mitigation

Data into Action: Expanded program for residents with Access & Functional Needs; launched graywater informational campaign

TEXAS 2011, 2015

Topic: Wildfire

Type: Response, Recovery

Data into Action: Documented post-fire recovery progress; led to changes in planning, notification, health education, resource allocation

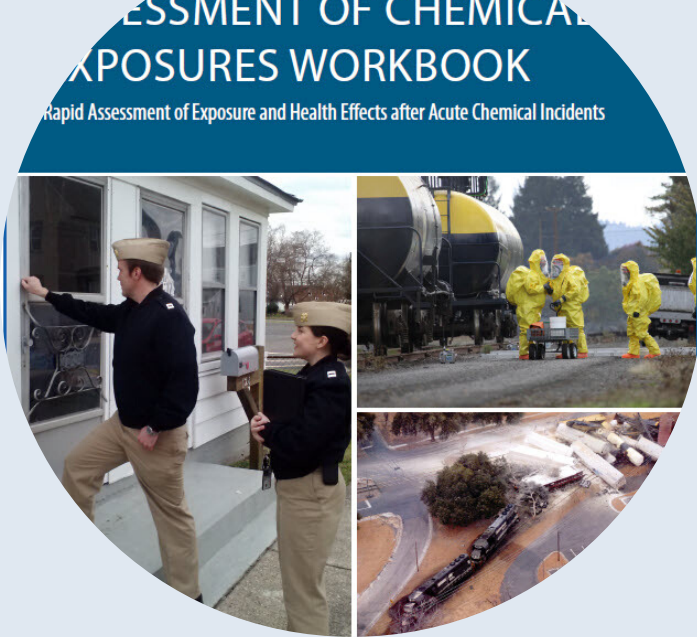


CASPER Community Assesse
Public Health Em
Response Tr



CASPER: Evidence-Based Situational Awareness

<https://www.cdc.gov/nceh/casper/default.htm>



ASSESSMENT OF CHEMICAL EXPOSURES (ACE)

ACE

- Provides a toolkit and training on assessing health impacts of a chemical incident and evaluating the response

TOOLKIT

- Training guides and workbooks
- Questionnaires (adult, child, household, pet, responder)
- Rapid Registry form
- Medical chart abstraction forms
- Databases

APPLICATIONS

- Identify what happened and who was exposed
- Document health effects and healthcare experience
- Help provide individual-level assistance to the exposed
- Register the exposed that may need long-term follow-up
- Evaluate emergency response (including shelter-in-place and/or evacuation), communications, and lessons learned
- Target outreach to prevent similar incidents
- Identify occupational health and safety gaps
- Improve chemical incident reporting and notifications



ACE EXAMPLES

SITUATION

A cylinder, believed to be empty, got punctured at a scrap metal recycling facility. This caused chlorine gas release, exposing workers, customers, and staff at a nearby business.

IMPACT

ACE identified multiple health effects among the 20+ exposed. ACE also determined that planned evacuation route led facility workers through the plume. Following the ACE, an alert with prevention recommendations was mailed to 1000+ recycling facilities.



SITUATION

A pipe ruptured on the roof of a refrigeration facility, releasing anhydrous ammonia. Ammonia drifted over a canal behind the facility, exposing staff on docked ships and at a nearby facility.

IMPACT

ACE identified that people in the area of the release were not notified. The county later obtained a reverse 9-1-1 system to alert businesses and residents in a defined geographic area and to deliver recorded emergency notifications.





DISASTER SURVEILLANCE

DEFINITION

- Systematic collection, analysis, interpretation, and sharing of injury, illness, death, and exposure data, which enables public health to identify adverse health effects in the community

TYPES

- Morbidity (disease)
- Mortality (death)
- Syndromic Surveillance/Emergency Department
- Shelter Surveillance
- Rapid Registry
- Medical chart abstraction
- Environmental exposures

PURPOSE

- Promptly identify and define outbreaks, exposures, and health threats
- Determine when, where, and how injuries, illnesses, deaths, and exposures occur
- Identify and prevent adverse health effects
- Evaluate at-risk groups by location
- Identify and implement public health interventions
- Track and evaluate response interventions
- Provide recommendations to mitigate future disaster consequences



SURVEILLANCE EXAMPLES

SITUATION

Mass gatherings of viewers for the 2017 solar eclipse had the potential to overwhelm healthcare systems due to a large influx of people to prime viewing areas in 14 states. Local emergency departments flagged patients who self-reported that they participated in eclipse events. Syndromic surveillance data from multiple emergency medical services and first-aid stations were monitored.

IMPACT

Eclipse event-related visits from dozens of patients were recorded. Chief complaints consisted of gastrointestinal and heat-related illnesses. Syndromic surveillance demonstrated the disease burden during a mass gathering event and identified links between participants.



SITUATION

A tornado touched down in a small city, leaving over 50 residents homeless. A shelter was activated for the affected residents. Upon check-in, staff noted that many of the residents had respiratory illness. The local health department enacted monitoring and surveillance of the ill shelter residents.

IMPACT

Ill shelter residents were isolated from the non-ill residents. The ill were provided medical care and infection control methods were shared with staff and other residents. The spread of the respiratory illness was stopped.





EMERGENCY RESPONDER HEALTH MONITORING AND SURVEILLANCE™ (ERHMS) FRAMEWORK

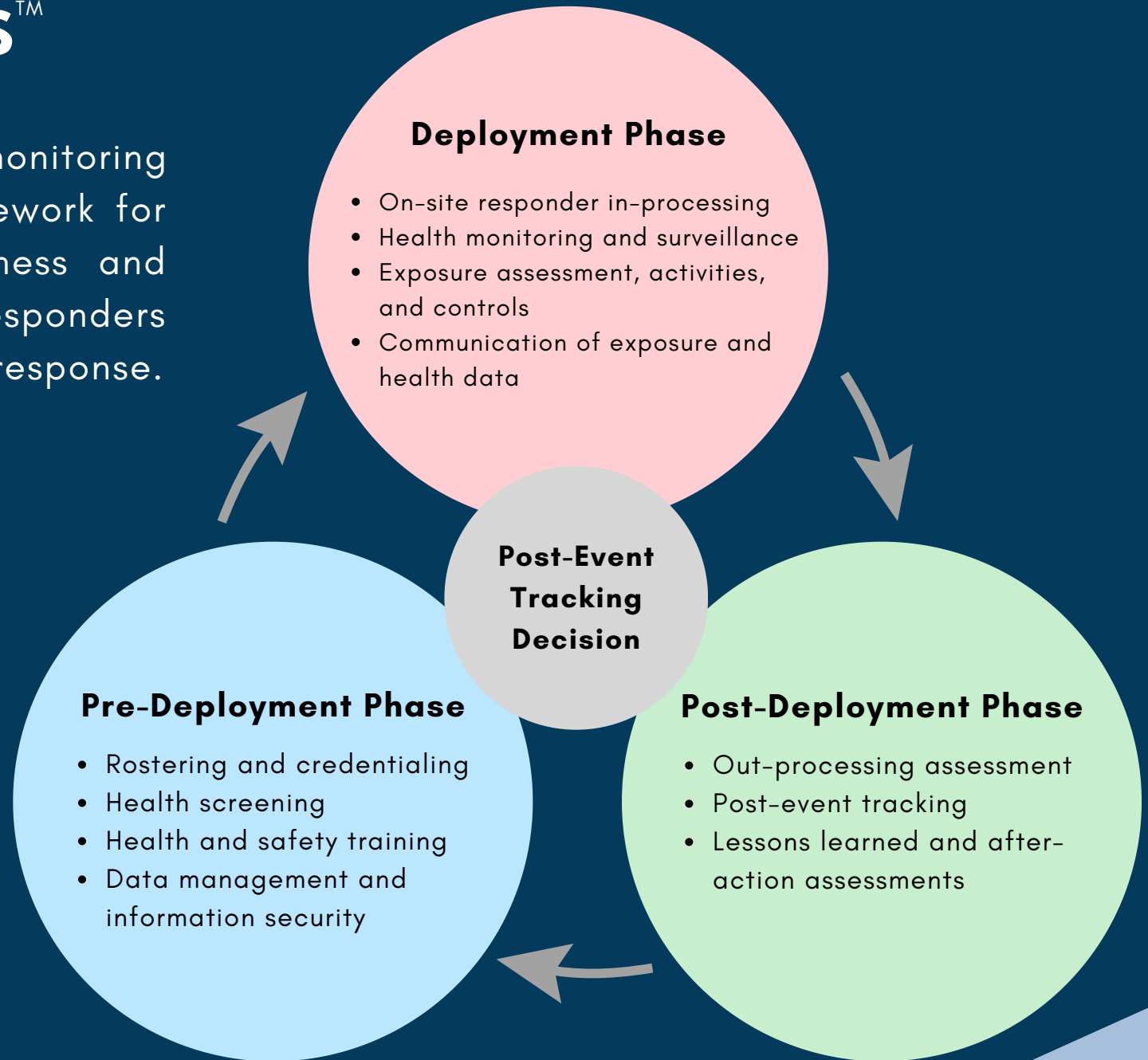
ERHMS™ FRAMEWORK HIGHLIGHTS

- Promotes worker safety and health for all response and recovery workers, including volunteers
- Tracks who is deployed and surveils and monitors their injuries, illnesses, and exposures
- Provides data to determine short-term and long-term health tracking needs
- Fits within Incident Command System
- Addresses Public Health Emergency Preparedness Capabilities 13, 14, and 15
- ERHMS Info Manager™ software available at no-cost to assist with implementation



ABOUT ERHMS™

ERHMS™ is a health monitoring and surveillance framework for the prevention of illness and injury to emergency responders during all phases of a response.



DISASTER EPIDEMIOLOGY FOR PREPAREDNESS

Before emergencies occur, Public Health data and methods inform all-hazards preparedness efforts.

Disaster Epidemiology:

- Uses available data to identify populations at-risk
- Maps the locations of vulnerable populations
- Assists in developing emergency plans
- Participates in functional exercises, tabletops, and drills



Disaster Epidemiology Preparedness Activities

ACTIVITY

PURPOSE

Rapid needs assessments

Determine level of community preparedness & identify populations at-risk

Hazard Vulnerability Assessments

Systematically evaluate potential disaster damage & develop a prioritized list of vulnerabilities for planning purposes

Joint Risk Assessments

Implement science-based risk management measures aligned between sectors through collaboration of decision-makers and technical experts

Epidemiological investigations & studies

Identify risk factors of disaster-related death, illness, injury, and exposure; determine appropriate interventions and preventions; provide greater understanding of disaster impact for future planning

DISASTER EPIDEMIOLOGY FOR RESPONSE

Public Health data on the health impacts of an emergency inform and support response activities.

Disaster Epidemiology:

- Integrates into response structure
- Uses local health departments and healthcare entities data
- Analyzes health and exposure data
- Develops real-time health and community status snapshots
- Performs community needs assessments, including current knowledge and attitudes



Disaster Epidemiology Response Activities

ACTIVITY

PURPOSE

Rapid needs assessments

Use epidemiologic techniques to provide emergency management and public health with household-based information about an impacted community

Surveillance

Systematically collect and analyze health and exposure data to inform, implement, and evaluate response activities

Mapping/GIS

Map areas of greatest impact and need to determine resource allocation

Morbidity and mortality reviews

Assess a disaster's morbidity and mortality impact to determine healthcare surge capacity, morgue and funeral home capacity, and provide data on the affected populations' overall status

DISASTER EPIDEMIOLOGY FOR RECOVERY

After active response to an emergency ends, Public Health data and methods inform recovery efforts as the community stabilizes and returns to normalcy.

Disaster Epidemiology:

- Identifies and documents on-going community needs
- Informs resource allocation
- Determines physical and mental health impact from the incident
- Evaluates interventions and provides recommendations to build resilience



Disaster Epidemiology Recovery Activities

ACTIVITY

Public health surveillance
& tracking systems

Registries

Rapid needs assessments

Epidemiological
investigations & studies

PURPOSE

Determine health impact from
incident

Monitor for long-term health
consequences

Identify on-going community
needs and priorities

Study public health impacts and
evaluate interventions

DISASTER EPIDEMIOLOGY FOR MITIGATION

Public Health data and methods support and inform structural and non-structural mitigation measures and priorities.

Disaster Epidemiology:

- Supports collaboration with Emergency Management
- Promotes community engagement
- Fills data and knowledge gaps
- Identifies community status and priorities
- Assesses beliefs, knowledge, and practices



Disaster Epidemiology Mitigation Activities

ACTIVITY

Rapid needs assessments

Hazard Vulnerability Assessments

PURPOSE

Promote community engagement, determine population vulnerabilities, inform mitigation priorities, identify beliefs, knowledge, and practices

Systematically evaluate potential disaster damage and cascading impacts from public health perspective & develop a prioritized list of vulnerabilities for structural and non-structural projects