NIOSH HHE and Emergency Preparedness Programs

Oregon Governor's Occupational Safety & Health Conference

March 9, 2009

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National Institute for Occupational Safety and Health

Agenda

- NIOSH and the HHE Program
- NIOSH and Emergency Response
  - Functions/Roles/Capabilities
  - Worker Safety and Health Annex
- Examples
  - Katrina
  - Indonesian Tsunami

Who We Are

1970 OSHAct…

OSHA - DOL

- Regulatory
- Enforcement

NIOSH - DHHS/CDC

- Research
- Surveillance
- Training
- Service

NIOSH Mission

- Conduct research to prevent occupational illnesses and injuries
- Make recommendations to regulatory agencies (OSHA)
- Train occupational health professionals
- Respond to requests for investigations of workplace hazards

The NIOSH HHE Program

- Congressionally mandated
- Responds to requests for assistance
- Provides current health hazard data to employees and employers
- Identifies problems and recommends workplace solutions
- Precipitates research and generates human exposure and toxicity data

Reasons to Request an HHE

- Workers with illnesses from unknown cause
- Exposure to unregulated hazards
- Adverse health effects and exposure below the PEL
- Medical or epidemiological studies needed
- Higher than expected illness rate in an exposed group
- Exposure to a new or unrecognized hazard

HHE Requests

- Employers
- Employees
- Employee Representatives
- Other Government Agencies

HHE Administration

- Review and categorization of requests
  - I. Invalid Request
  - II. Requester receives information
  - III. Site visit is conducted
  - IV. Research Project

Hazard Evaluation

- Background Assessment
- Initial Field Investigation
- Environmental and Medical Studies
- Hazard Determination

HHE Procedures

- Telephone Contact
- Site Visit(s)
  - Opening conference
  - Walk-through survey/process review
  - Confidential employee interviews
  - Environmental monitoring
  - Medical evaluation
  - Closing conference
- Report

Final Report

- Summary
- Introduction and Background
- Evaluation Methods
- Evaluation Criteria
- Results and Discussion
- Conclusions and Recommendations
- References

Report Distribution

- Requesters
- Employer
- OSHA
- Other appropriate agencies
- Public distribution from NTIS

Examples of Health Hazard Evaluation Projects


NJ 7843


SAFETY
Please
NO
Perfumes or
Lotions
Perfumes & Lotions make
Gwen, Cindy, Pat & Sue
unable to breath
FIRST

Illnesses of Unknown Cause

- Bronchiolitis obliterans, asthma
- Related to diacetyl/flavorings)

Old Problems in New Places

- **Silica**
- **Noise**
- **Cement roofing tiles**

Emerging Diseases

Progressive Inflammatory Neuropathy
Pork Processing Plant

MMWR
Morbidity and Mortality Weekly Report
www.cdc.gov/mmwr

Early Release
Vol. 57 / January 31, 2008

Investigation of Progressive Inflammatory Neuropathy Among Swine Slaughterhouse Workers — Minnesota, 2007–2008

On October 29, 2007, the Minnesota Department of Health (MDH) was notified by a tertiary-care provider of unexplained neurologic illnesses among workers in a swine slaughterhouse (plant A) in southeast Minnesota. As a result, MDH initiated a detailed investigation at plant A to characterize the outbreak. This report describes the ongoing investigation and outbreak-control measures undertaken by state public health officials and CDC.

Plant A, located in southeastern Minnesota, employs approximately 1,200 workers and processes 18,000 pigs per day. After being notified of the illnesses, MDH investigators initiated active case finding, interviewed workers at plant A, and reviewed the plant's occupational health and employment records. As of January 28, 2008, a total of 12 workers at plant A had been identified with confirmed (eight workers), probable (two), or possible (two) progressive inflammatory neuropathy (PIN) (Box). Illness onset ranged from November 2006 through November 2007. Median age of the 12 patients was 31 years (range: 21–51 years); six patients were female. All 12 patients reported being healthy before the onset of neurologic symptoms.

Symptoms ranged from acute paralysis to gradually progressive symmetric weakness over periods ranging from 8 to 213 days. Severity ranged from minor weakness and numbness to paralysis predominantly in the lower extremities affecting mobility. Eleven patients had evidence of axonal or demyelinating peripheral neuropathy by electrodiagnostic testing. Cerebrospinal fluid was obtained from seven patients. All seven had elevated protein levels (median: 125 mg/dL; range: 75–231 mg/dL [normal: 14–45 mg/dL]) with no or minimal pleocytosis (median: 1 cell/dL; range: 1–73 cells/dL in a nontraumatic tap); five patients had evidence of inflammation on spinal magnetic resonance imaging (four patients in peripheral nerves or roots and one patient in the anterior spinal cord).

All 12 patients reported either working at or having regular contact with an area where swine heads were processed (known as the head table), which was located within a larger processing area in plant A known as the warm room. A case-control study was conducted among plant A workers to identify specific risk factors associated with illness. The 10 patients with confirmed or probable cases were included

BOX. Working case definition for progressive inflammatory neuropathy among swine slaughterhouse workers, 2007–2008

Epidemiologic criterion
- Participation in or close exposure to commercial or private swine-slaughtering operations.

Clinical criteria
- New onset of bilateral and relatively symmetric flaccid weakness/paralysis of the limbs, with or without involvement of cranial-nerve innervated muscles
- New onset of decreased or absent deep-tendon reflexes at least in affected limbs.

Diagnostic criteria
- Electrodiagnostic studies consistent with axonal or demyelinating peripheral neuropathic features in affected limbs and not attributable to an underlying chronic disease process.
- Neuroimaging consistent with radiculitis, myelitis, or encephalitis.
- Cerebrospinal fluid protein level >45 mg/dL (with or without pleocytosis).

Exclusion criterion
- Identification of an alternative etiology for clinical or diagnostic findings.

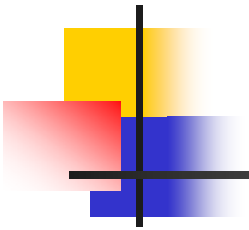
Case classification
- Confirmed case: Meets epidemiologic criterion, meets both clinical criteria, and has electrodiagnostic studies consistent with axonal or demyelinating features.
- Probable case: Meets epidemiologic criterion, at least one clinical criterion, and at least one diagnostic criterion.
- Possible case: Meets epidemiologic criterion and at least one clinical criterion.

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

Enriching the HHE Mix

Interest in HHE projects that:

- Involve new and emerging issues
- Have potential for industry-wide impact
- Provide opportunities for collaboration
- Add to the science base (e.g., analytical)
- Help solve existing or suspected workplace health problems



Emergency Preparedness at NIOSH

Why include Occupational Health and Safety in an Emergency?

At every natural disaster,
chemical outbreak,
infectious disease outbreak,
radiologic,

or terrorist event…

There are workers who are at potential risk...

NIOSH Emergency Preparedness and Response Office (EPRO)

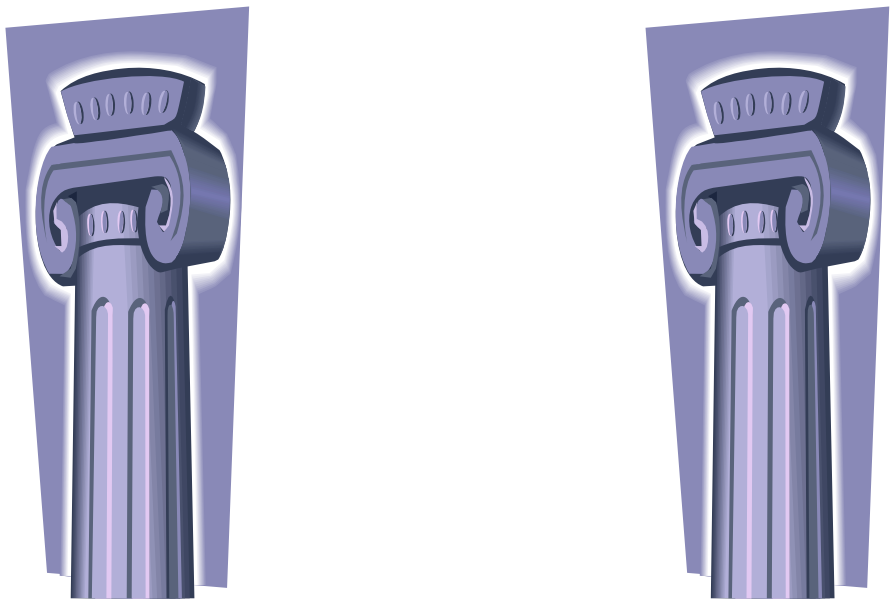
To protect the health and safety of emergency response and recovery workers in anticipation of and during public health emergencies by:

- serving as a focal point of technical expertise
- facilitating rapid and specific on-site support
- advancing research and collaborations to enhance such efforts

EPRO Focus Areas

Preparedness and Deployment

Research and Technical Assistance



Preparedness and Deployment Experienced Staff

- Experienced staff who can deploy to the emergency site or provide subject matter expertise from the office
- Training includes:
  - HAZWOPR
  - Respirator training (as required by 1910.134)
  - Tabletop exercises
  - Incident command
  - Anthrax environmental sampling
  - Field experience in complex/highly charged environments

NIOSH Emergency Responders

Different Disciplines

Physicians, Nurses, Epidemiologists, Statisticians, Psychologists

Industrial Hygienists, Engineers, Toxicologists, Behavioral Scientists

Roles and Responsibilities

Personal Protective Equipment

- Provide guidance on personal protective equipment for potentially exposed workers
- Examples: SARS, WTC, anthrax mailroom workers and decontamination workers, tsunami, hurricane response

Roles and Responsibilities

Exposure Assessment and Monitoring

- Recommendations on Exposure Assessment issues
- Decide if, when, and where exposure assessment is needed
- Develop environmental sampling methods and strategies

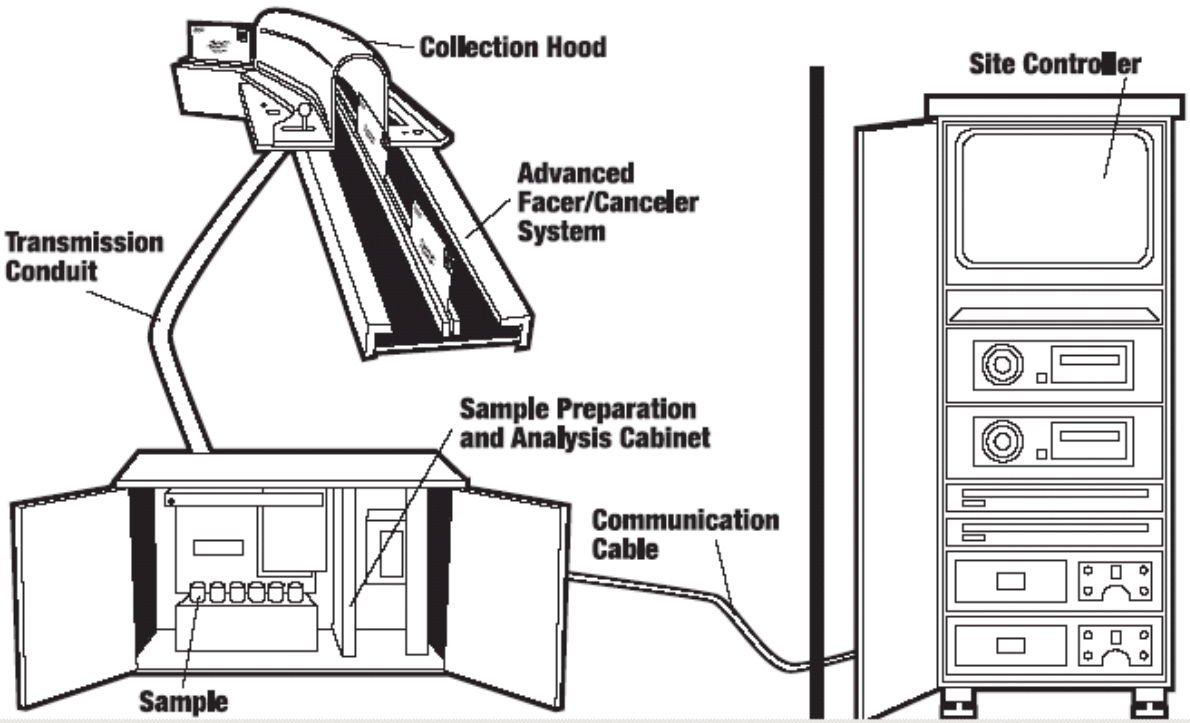
BioWatch Response

Swab Sampling - Ricin

2006 – NYC Anthrax

UNITED STATES POSTAL SERVICE

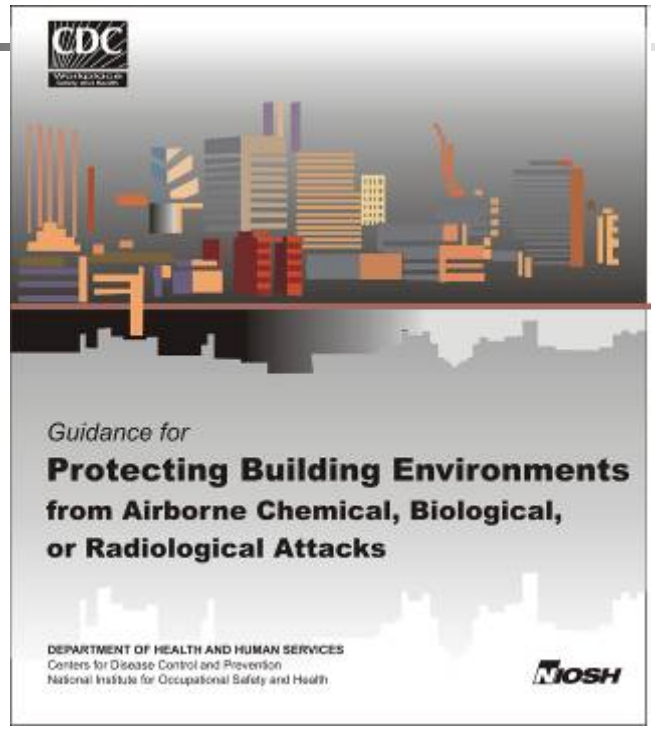
BIOHAZARD DETECTION SYSTEM

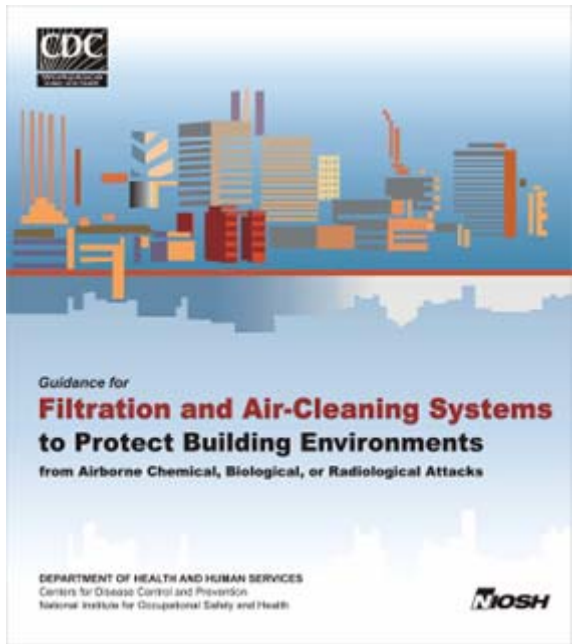


BDS System

Roles and Responsibilities

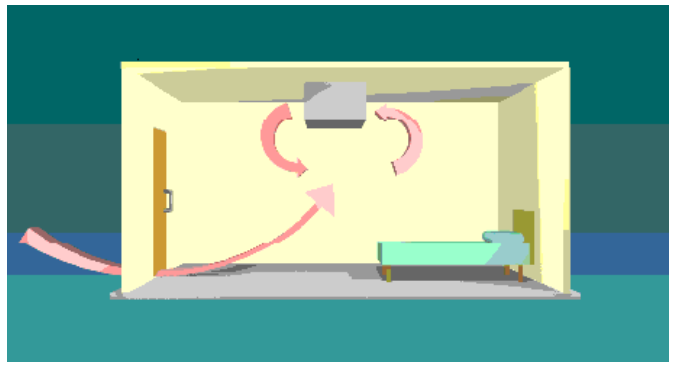
- Develop preparedness guidance for businesses and workers





Assist with Available Workplace Controls

- Ensure adequacy of engineering, environmental, and administrative controls
- e.g. conducting ventilation assessment on negative-pressure isolation rooms (SARS)



Isolation Room Smoke Test

(Taichung Military Hospital)


健 您 祝 院 醫

Other Activities

- Certification of CBRN respiratory protective devices
- Development of Immediately Dangerous to Life and Health (IDLH) criteria
- Funding of WTC medical screening, monitoring and treatment program

Pandemic and Avian Influenza

- Researching modes of influenza transmission in an urgent care facility
- Evaluating decontamination and re-use of N95 respirators
- Researching frequency of fit-testing
- Guidance for Health Care Workers

NRF Worker Safety and Health Annex

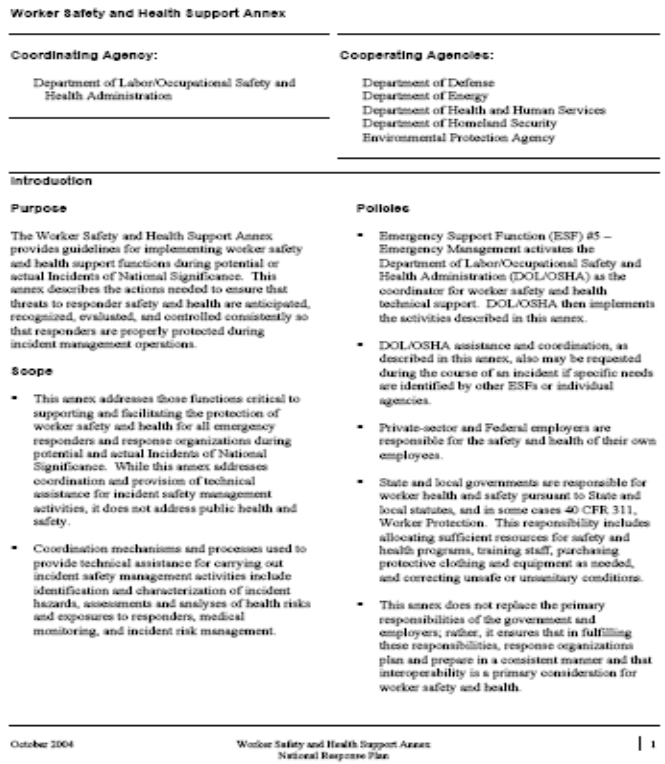
The Worker Safety and Health Support Annex provides guidelines for implementing worker safety and health support functions during Incidents of National Significance.

Worker S&H Annex

- The annex is intended to ensure responders are properly protected.
- DOL/OSHA coordinates Federal safety and health assets
- Private-sector and Federal employers are responsible for the safety and health of their own employees

Worker S&H Annex

- Numerous Cooperating Federal Agencies:
  - EPA
  - NIEHS
  - DOD USACOE
  - DHS
  - NIOSH
  - ATSDR



Worker Safety and Health Support Annex

Coordinating Agency:

Department of Labor/Occupational Safety and Health Administration

Cooperating Agencies:

Department of Defense
Department of Energy
Department of Health and Human Services
Department of Homeland Security
Environmental Protection Agency

Introduction

Purpose

The Worker Safety and Health Support Annex provides guidelines for implementing worker safety and health support functions during potential or actual Incidents of National Significance. This annex describes the actions needed to ensure that threats to responder safety and health are anticipated, recognized, evaluated, and controlled consistently so that responders are properly protected during incident management operations.

Scope

- This annex addresses those functions critical to supporting and facilitating the protection of worker safety and health for all emergency responders and response organizations during potential and actual Incidents of National Significance. While this annex addresses coordination and provision of technical assistance for incident safety management activities, it does not address public health and safety.
- Coordination mechanisms and processes used to provide technical assistance for carrying out incident safety management activities include identification and characterization of incident hazards, assessments and analyses of health risks and exposures to responders, medical monitoring, and incident risk management.

Policies

- Emergency Support Function (ESF) #5 – Emergency Management activates the Department of Labor/Occupational Safety and Health Administration (DOL/OSHA) as the coordinator for worker safety and health technical support. DOL/OSHA then implements the activities described in this annex.
- DOL/OSHA assistance and coordination, as described in this annex, also may be requested during the course of an incident if specific needs are identified by other ESFs or individual agencies.
- Private-sector and Federal employers are responsible for the safety and health of their own employees.
- State and local governments are responsible for worker health and safety pursuant to State and local statutes, and in some cases 40 CFR 311, Worker Protection. This responsibility includes allocating sufficient resources for safety and health programs, training staff, purchasing protective clothing and equipment as needed, and correcting unsafe or unsanitary conditions.
- This annex does not replace the primary responsibilities of the government and employers; rather, it ensures that in fulfilling these responsibilities, response organizations plan and prepare in a consistent manner and that interoperability is a primary consideration for worker safety and health.

Worker S&H Annex

- NIOSH Responsibilities
  - technical support and expertise in the characterization of complex, unknown, and multiple-contaminant worker exposures
  - collaborate in all areas so collective safety and industrial hygiene assets produce consistent, vetted advice to the incident command structure

Hurricane Katrina

Protecting Workers During Recovery and Rebuilding

CDC Workplace Safety and Health

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NIOSH

Hurricane Katrina

- Unprecedented Disaster
- NIOSH Response within:
  - CDC Response Structure
  - NRP Worker Safety and Health Annex
- Multiple Challenges
  - Diffuse Area
  - Access
  - Occupational Health and Public Health

NIOSH Katrina Response

Emergency Coordinator
Atlanta, Georgia
Max Kiefer
404-406-0604

Washington Liaison
Matt Gillen
202-401-2193

Support
Logistics
Laboratory
Equipment

Field Response Coordination
Cincinnati, Ohio

Allison Tepper, HETAB Branch Chief
513-841-4425

Exposure Database
Cincinnati, Ohio
Jim Boiano
513-841-4246

New Orleans Field Teams
IH/Medical
POC: Greg Burr
678-859-3728
Tom Hales
513-841-4386

Joint Field Office POC
Baton Rouge, LA
Jennifer Hornsby-Myers
404-975-9925

Activities /Protective Approach

Occupations at risk

- Debris removal and environmental cleanup
- Levee rebuilding
- Infrastructure (industrial) rebuilding
- Residential refurbishment

- Worker Safety and Health Annex (NRP)

Exposures

- Highest Risk Response and Recovery Workers
- Environmental sediment data (metals)
  - Worst case modeling to OEL's
- Industrial hygiene
  - Metals, Asbestos, PAH's, VOC's, Silica
  - Various tasks
- Heat Stress, Noise
- Psychological Stress and Work Organization
- Trauma Risk (lacerations, falls, trips)
- Mold

OSH Activities

- Onsite field teams
- Information dissemination
- Screening recommendations
- Training and outreach
- Biomonitoring (considered)
- Registry (considered)

Some Challenges

- The size of the problem
  - How many workers
  - Multiple Employers
  - Employee demographics (non-union, undocumented)
  - Who is doing what (Diffuse)
  - Beyond New Orleans

Some Challenges, Cont.

- Exposure Characterization
  - Variability (environment)
  - Variability (activities)
  - Broad area affected
  - Activity phase
- Work Practice/Training
- Risk Communication

Guidance for Responders (CDC WebSite)

- **Protective Equipment For Workers In Hurricane Flood Response**
- **Entry into Confined Spaces in Hurricane Damaged Areas**
- **Clean-Up Workers Involved with Handling and Burning Hurricane Debris**
- **Personal Protective Equipment and Clothing for Flood Response Workers**
- **Natural Disasters: Response, Cleanup & Safety for Workers**

Guidance for Providers
CDC Website

- **Occupational Health and Safety Survey Tool - Hospitals and Medical Care Facilities**
- **Occupational Health and Safety Survey Tool - Evacuation Centers (Employee Injury or Illness Form)**

Issues

- Occupational/Community Exposures and Biomonitoring
  - Pressure from Public
  - Scientific disagreement
  - Uses and limitations
- Registry/Roster
  - Workers in uncharacterized environment
  - Records not kept or poorly kept

Responder Safety and Health

- **Pre-Deployment Medical Screening of Workers**
  - **Document baseline health parameters**
  - **Identify individuals with health concerns**
  - **Identify individuals with specific susceptibilities**
  - **Identify individuals not suitable because of health reasons**
  - **Identify medications that may be affected by deployment**
  - **Identify immunization needs**
  - **Identify training needs**

Responder Safety and Health

Post Deployment Medical Screening of Workers

Detect adverse mental or physical health effects related to work or exposure

Identify those who need further medical evaluation and treatment

Monitor developing trends and patterns of illness

Responder Safety and Health

- Medical Screening Guidance for Workers Deploying to a Disaster Site
  - Pre-exposure http://www.cdc.gov/niosh/topics/flood/preexposure.html
  - Post-exposure http://www.cdc.gov/niosh/topics/flood/MedScreenWork.html

NIOSH and the 2005 Tsunami Response

The findings and c
Occupational Safe

Workplace Safety and Health

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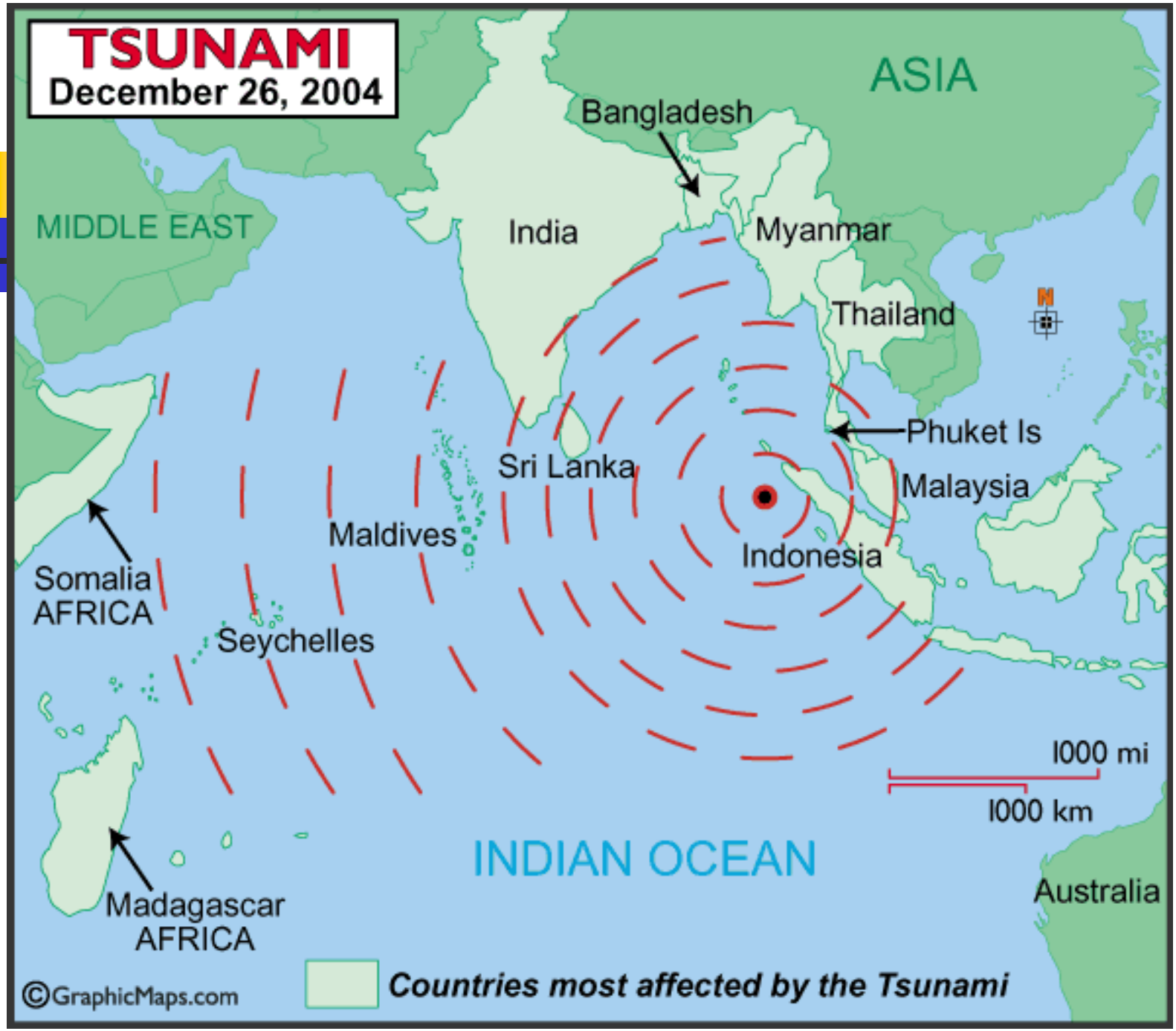
NIOSH

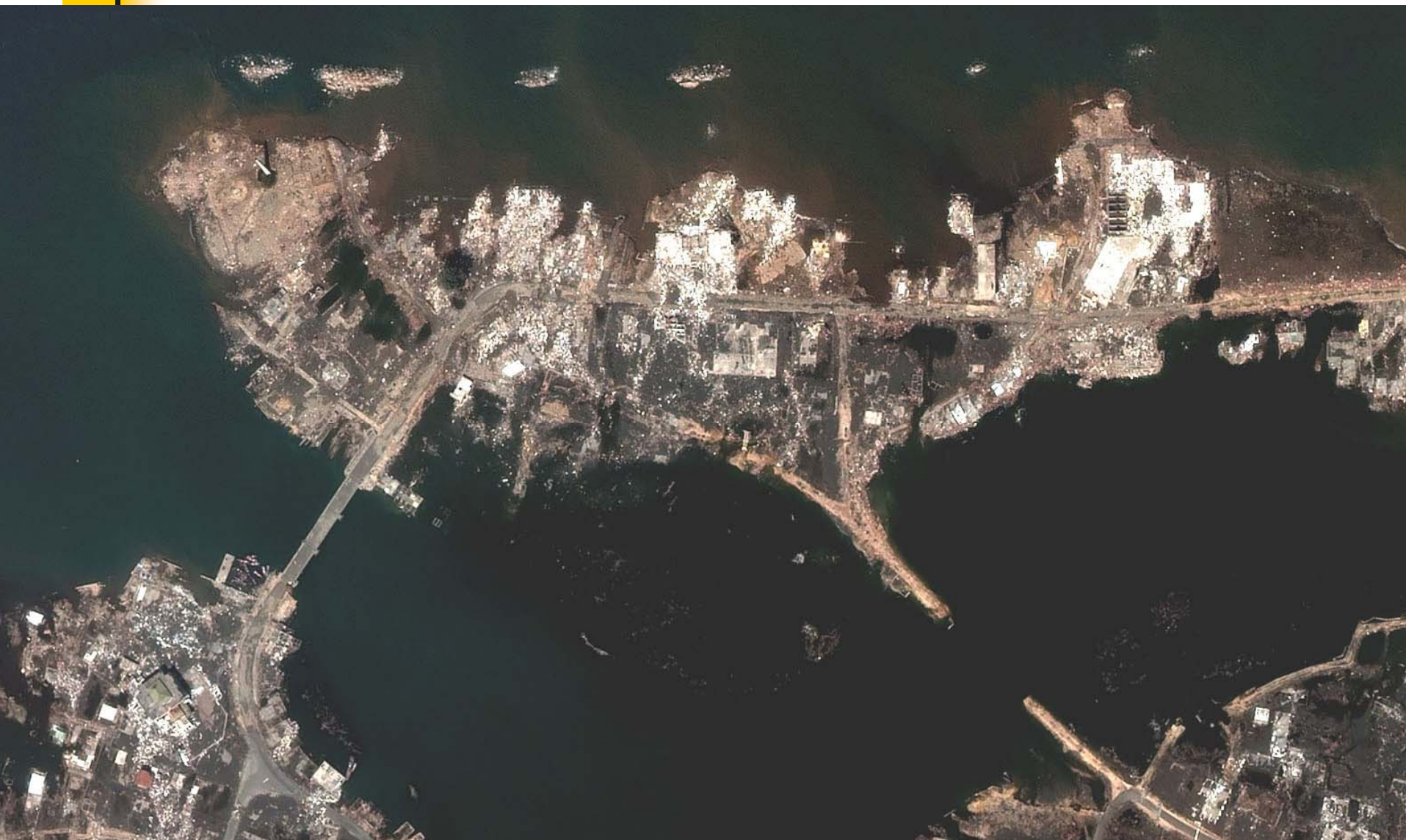

TSUNAMI
December 26, 2004
ASIA
Bangladesh
MIDDLE EAST
India
Myanmar
Thailand
N
Phuket Is
Sri Lanka
Malaysia
Maldives
Indonesia
Somalia
AFRICA
Seychelles
1000 mi
1000 km
INDIAN OCEAN
Australia
Madagascar
AFRICA
©GraphicMaps.com
Countries most affected by the Tsunami

Banda Aceh Shore (Before Tsunami)

Source: DigitalGlobe

Banda Aceh Shore (After Tsunami)

Source: DigitalGlobe



Multiple Occupational/Environmental Issues

Mission

- Assessment & assistance on disaster exposure, illness, and injury of work groups
- Environmental/ industrial hygiene guidance on hazards
- Medical, epidemiologic, surveillance guidance of working groups
- Facilitate employee/labor representation
- Provide communication and needed written materials

Team Members

- Adequate training and experience
- Handle hazardous, contentious, and gruesome situations
- Deal with Multiple Bureaucracies, changing priorities, multiple charges
- Able to write under pressure
- Sense of humor, team work
- Know capacities of their Center

Initial Team Activities

Identify Field Experienced personnel with

- Disaster experience
- 3rd world experience/Language
- Indian Health Service experience
- Specific Skill sets (wat/san, IH, med/epi, engineer, etc.)

Reviewed, Compiled Relevant Occ/Env Information

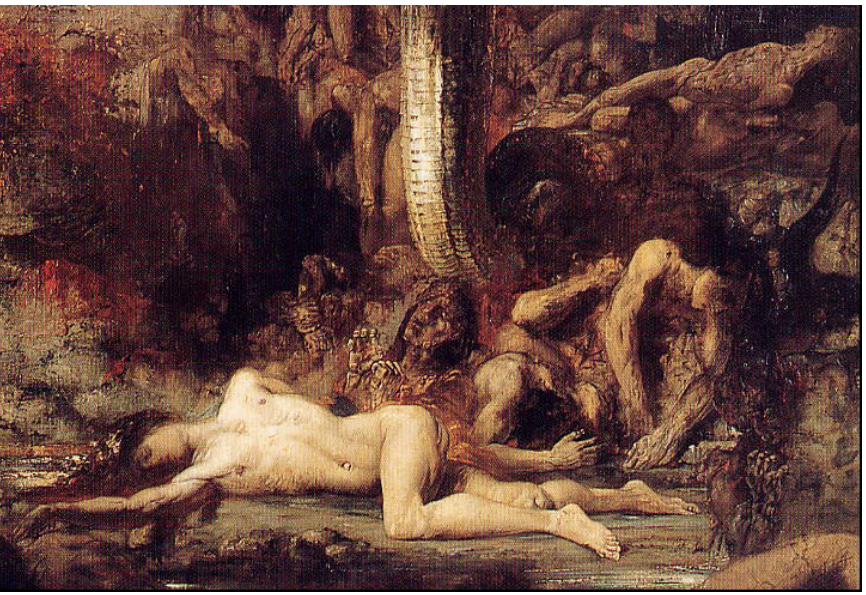
- Websites for relevant information e.g., floods, destruction, electrical safety, construction...
- International, WHO, Trade Assoc. materials
- Checklists, guidelines, and standards
- Worked with CDC Communications for posting on WEB, translated (Acehanese, Basaha, Bengali, Sinhala,Thai), and sent out with deployed

AIHA
Your Essential Connection

AIHA Involvement

- AIHA contacted members to identify damaged facilities, toxic sites, and chemical spills in the affected areas
- Assisted CDC with Daily emails on findings
- Kept members up to date on Tsunami Clean-up and Occ Env Issues

Developed Guidance Documents



- Workers who handle Human Remains
- Health and Safety guidelines for forensics at Temporary Morgues (...assisted ground team)
- Disposal of liquid human waste from autopsies in tsunami affected areas (with EPA)
- Documents on CDC website

Dealt with Pesticide Applicators

- Worked with Indonesian Contractor regarding pesticides
- Developed and disseminated guidance on pesticide safety for local pesticide applicators;
- On CDC website: http://www.bt.cdc.gov/disasters/tsunamis/pdf/tsunamiworkers-pesticidesafety.pdf

Addressed Mental Health Issues

- Mental Health Experts dealt with deployment issues and occupational stress
- Special sessions for deployed dealing with death and burial in affected areas
- Special sessions dealing with stress reactions, availability of assistance, when and how to seek assistance from the field

Banda Aceh – Near Total Destruction

Restoration of Electrical Utility Service a Priority in 19 Aceh Provinces

Indonesian Electrical Workers, in a local Union in Banda Aceh, were restoring power to the Aceh Provinces but were at risk of electrocution and burns because their personal protective equipment [PPE] had been lost in the tsunami.

Contacted Workers' Union in Banda Aceh

1. Called International AFL-CIO Solidarity Center Office in D.C.

2. Linked up with Union Rep in Jakarta, Indonesia

3. Reached Electrical Worker's Union in Banda Aceh, Indonesia

We learned of their use of PPE, their exact needs, work practices

OEH Team Actions

1. The Team coordinated efforts to provide 50 electrical workers with needed personal protection equipment to perform their work safely.

2. The Team identified U.S. manufacturers of Electrical Safety Equipment through a liaison with the International Safety Equipment Association.

3. The Team prioritized and coordinated the donations from US manufacturers to a central collection point for consolidation into a single shipment.

4. CDC materials logisticians coordinated packing in Atlanta for air freighting to the World Health Organization and International Union representatives in Jakarta, Indonesia.

Air Freight to Indonesia

Three cargo-pallet skids with a total weight of 1,493 pounds were sent directly to the electrical union workers in Banda Aceh.

Retail Value = >$30,000

PPE shipment left Atlanta on 1-28-05 to Taipei, China, then to Kuala Lumpur, Malaysia, and then to Jakarta, Indonesia.

The shipment cleared customs in Jakarta, and was then placed on a chartered C-130 and flown directly to Banda Aceh arriving on 2-5-05.

The total transit and delivery time to Banda Aceh was 9 days.

Aceh Electrical Workers receiving the PPE shipment

Eddy Irawan,

Deputy Chairman, State Electric Power Company Worker's Union

CDC Occ-Env Field Activities

- Assess existing hospital and public health laboratory capacity (Banda Aceh)
- Biosafety, worker protection at mass mortuary facilities -Thailand
- Mental health and mass trauma recovery - Thailand (USAID, MOH)
- Recovery worker health and safety - Thailand

(Photo: Mark Simmerman)

Provide Environmental and Occupational Health Assessments for Workers at Temporary Morgue Facilities

Thai corpse storage

Foreign corpse storage


Coca-Cola


SHARP
R-242

MMWR™
Morbidity and Mortality Weekly Report

Health Concerns Associated with Disaster Victim Identification After a Tsunami --- Thailand

The number of persons confirmed dead from the Indian Ocean tsunami that struck on December 26, 2004, had exceeded 174,000 as of March 31, 2005; the majority of decedents were buried or cremated without being identified. In contrast, in Thailand, disaster victim identification (DVI) continues, with approximately 1,800 persons identified among the 5,395 persons confirmed dead; of the dead, approximately 50% were not citizens of Thailand (1). This large-scale, multinational effort faced immediate challenges, including establishment of four temporary morgues, implementation of safeguards against environmental and occupational health hazards, and coordination of forensic procedures and safety protocols among Thai and international forensic teams. Public health and other agencies performing large-scale DVI in temporary morgues might consider implementing the recommendations and procedures described in this report.

Temporary Morgue Operations

After the tsunami struck, DVI teams totaling at least 600 persons, from Thailand and approximately 30 other countries, converted temples and other buildings in the provinces of Phangna, Phuket, and Krabi into four temporary morgues by modifying buildings and procuring DVI equipment and supplemental electricity. To store and preserve bodies, which were initially cooled with dry ice, refrigerated containers were procured. Bodies were stored in these containers until identified and released.

Thank you for your Attention

Max Kiefer

303-236-5944

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