

# The NDMS Role in Disaster Surveillance: Applied Disaster Epidemiology



# Objectives

1. Recognize the NDMS role in data collection
2. Anticipate common injury and disease patterns – identify what may be unique
3. Comprehend NDMS information management – medical intelligence – and how it guides decisionmaking



# The Value of Data in a Disaster

- Data collected by NDMS provides epidemiology and surveillance data that are valuable assets and tools in disaster response = (medical intelligence)
- Collected information is used for purposes of situational awareness and emergency operations planning by the Office of Preparedness and Emergency Operations, Emergency Management Group



# Your Data Adds to the Common Operating Picture



# Secretary's Operation Center

- 24/7 capability to coordinate information between public health agencies & organizations
- Facility that provides a single focal point for information sharing, command and control, communications, and information collection
- Specialized technologies: Manages WebEOC, the Hospital Assets Reporting and Tracking System (HARTS), and relays info with the Homeland Security Information Network (HSIN)
- Provides geospatial or GIS imaging products



# Going Back to the Beginning...

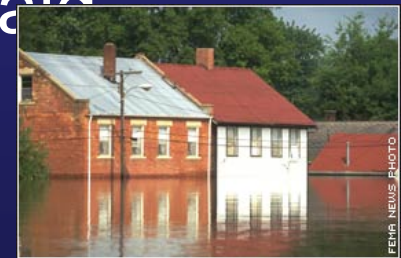


1/2008

# A Disaster Occurs...

“ A disaster is the result of a **vast ecological breakdown in the relation between humans and their environment**, a serious and sudden event (or slow, as in a drought) on such a scale that the stricken **community** **needs extraordinary efforts** to cope with it, often with **outside help** or international aid.”

In E.Noji, from *Multilingual dictionary of disaster medicine and international relief*, and Brussels: Centre for Research on the Epidemiology of Disasters.



# Three Fundamental Public Health Responsibilities in Disasters

## 1. **Assess needs**

- Surveillance / medical intelligence
- Work smarter

## 2. **Ensure access**

- Immediate – SNS, RDFs, DMATs
- Long-term – not competition with local services

## 3. **Collect, analyze, and report**

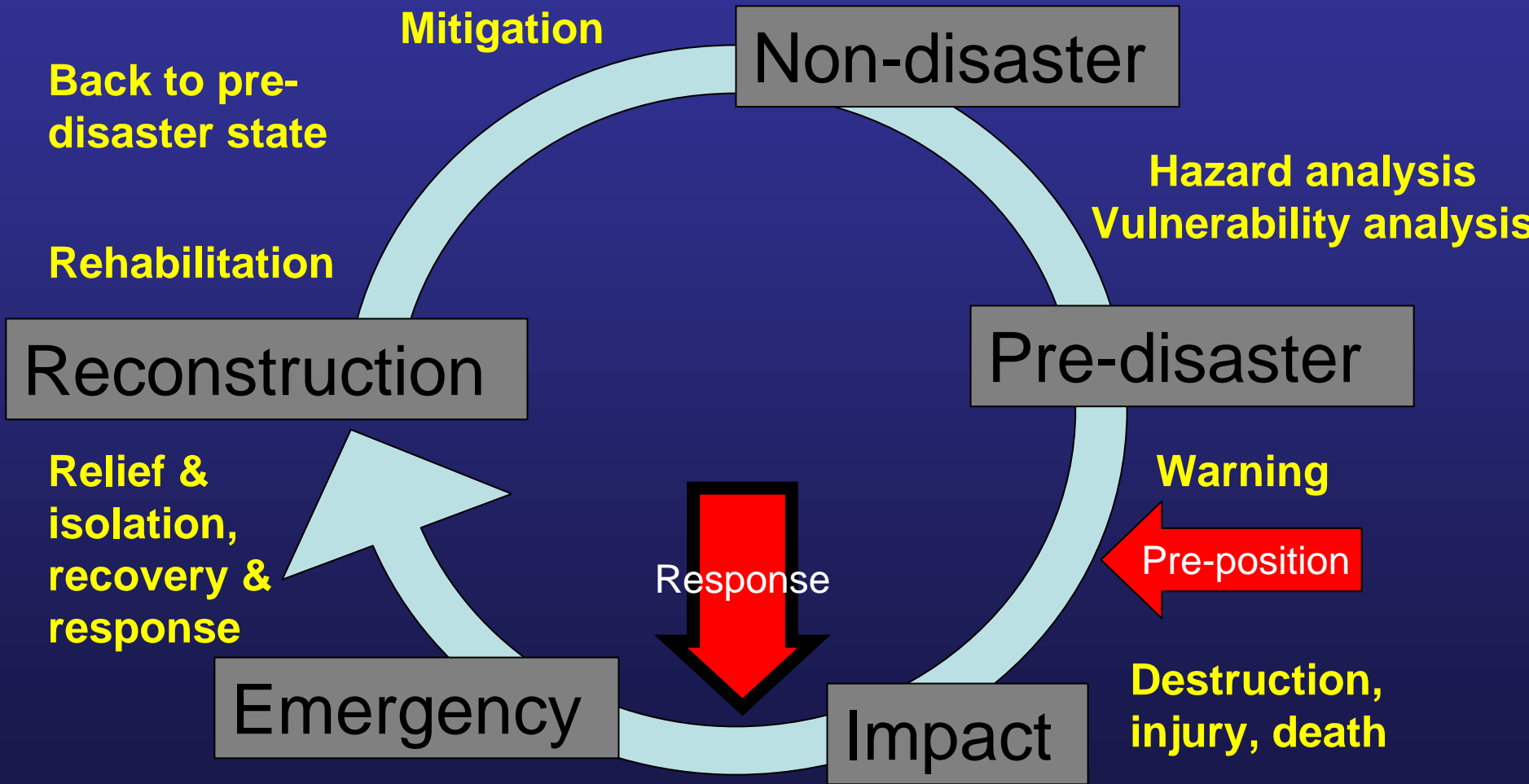
- Inform decisionmakers and the public
- Not research – apply data to benefit the people



Assessing needs and having  
situational awareness is the  
cornerstone of a successful public  
health response



# The Disaster Cycle - Captain Eric Noji, MD, MPH



Knowing where you are in the disaster cycle will help focus your response and surveillance; knowing what other HHS assets are in the field will help you center your attention on your primary mission attention



# Types of Disasters

## I. Natural – generally good community resilience

### **Sudden Impact – Acute Onset**

- Earthquakes, tsunamis, tornadoes, floods, tropical storms, hurricanes, cyclones, typhoons, volcanic eruption, landslides, avalanches, wildfires, ice-storms
- Epidemics of water-, food-, or vector-borne diseases and person-to-person transmission of diseases

### **Slow or Chronic Onset**

- drought, famine, environmental degradation, chronic exposure to toxic substances, desertification, deforestation, pest infestation (locusts)



# Types of Disasters

II. Human-generated – accident or deliberate  
– generally poor community resilience

1. **Industrial/technological** – system failures/accidents, chemical/radiation, spills, pollutions, explosions, fires, terrorism
2. **Transportation** – train, plane, tunnel, bridge collapse
3. **Deforestation**
4. **Material shortages** – fuel, electricity, food
5. **Complex Emergencies** – wars and civil strife, armed aggression, insurgency, other actions resulting in displaced persons and refugees



# Disaster Response Phases

## And general anticipated healthcare impact

1. **Pre-Event**
  - Evacuation injuries and chronic disease flair
2. **Acute – 0-72 hours**
  - death, close-calls, some injuries, off-meds
  - overall decrease demand for health services
3. **Sub-acute – 3-7 days**
  - sporadic clinic closures and staff no-shows
  - clean-up / recovery injuries, shelter syndromes
  - interruption in home-health services, displaced
4. **Chronic – 7-90 days**
  - clinics & pharmacies resume operation, employ staff
  - marginalized populations still need assistance
    - homeless, drug/alcohol-dependent, schizophrenic



# Examples of Some Common Injury and Disease Patterns



# Hazard – Expected Injury

Most deaths are immediate; life-saving care is local

Blizzard / ice storm	CO-poisoning, hypothermia, chronic disease flair, stress-related disorders
Hurricane Flooding Tsunami	Drowning, electrocution, cuts, fractures, wound infections, heart attacks, stress-related disorders
Earthquake	Fractures, crush, dehydration, stress-related disorders
Heat wave	Dehydration, heat syndromes – syncope, cramps, exhaustion, stroke
Tornado	Head and soft tissue injuries, fractures, wound infections



# Cyclones, Hurricanes, Typhoons

1. **Cause of Injury** – failure to evacuate, take shelter, secure property, and follow post-event food, water, and personal safety advice
2. **Anticipated Injuries and demands for care**
  - a. **Acute Phase (0-72 hours)**: near-drowning, electrocution, cuts, fractures, heart attacks
  - b. **Sub-acute Phase (3-7 days)**: cuts, wound infections, fractures, burns, heart attacks, GI / respiratory / skin infections, vector-borne disease, animal bites, meds replacement, narcotic diversion
  - c. **Chronic Phase (7-90 days)**: Chronic disease flare, stress-related, STDs, pregnancy, meds replacement, narcotic diversion, Schizophrenia off-meds



# Floods

## 1. Cause of Injury

a. **Flash floods** – trapped in car, crossing streams

b. **Torrential rains** – evacuation and shelter morbidities

**Floods – Generally only focal pockets of devastation, with surrounding region infrastructure intact**

## 2. Anticipated Injuries and demands for care

a. **Acute Phase (0-72 hours)**: near-drowning, electrocution, cuts, fractures, heart attacks

b. **Sub-acute Phase (3-7 days)**: cuts, wound infections, heart attacks, GI / respiratory / skin infections, meds replacement, narcotic diversion

c. **Chronic Phase (7-90 days)**: Vector-borne disease, chronic disease flair, stress-related



# Pediatric Bomb Injuries in Israel

160 casualties < 18 years, 41 MCEs, 2000-2002

Over half of casualties  
- Head or face injury

Almost half Orthopedic

Type of Injury	
Fracture	67 (45%)
Internal Organ	41 (27%)
Open wound	84 (56%)
Burns	13 (9%)

Site of Injury	
Brain	32 (21%)
Other head	74 (49%)
Spinal column	4 (3%)
Chest	25 (17%)
Abdomen	25 (17%)
Pelvis, back	25 (17%)
Arms	58 (39%)
Legs	70 (47%)

HEENT

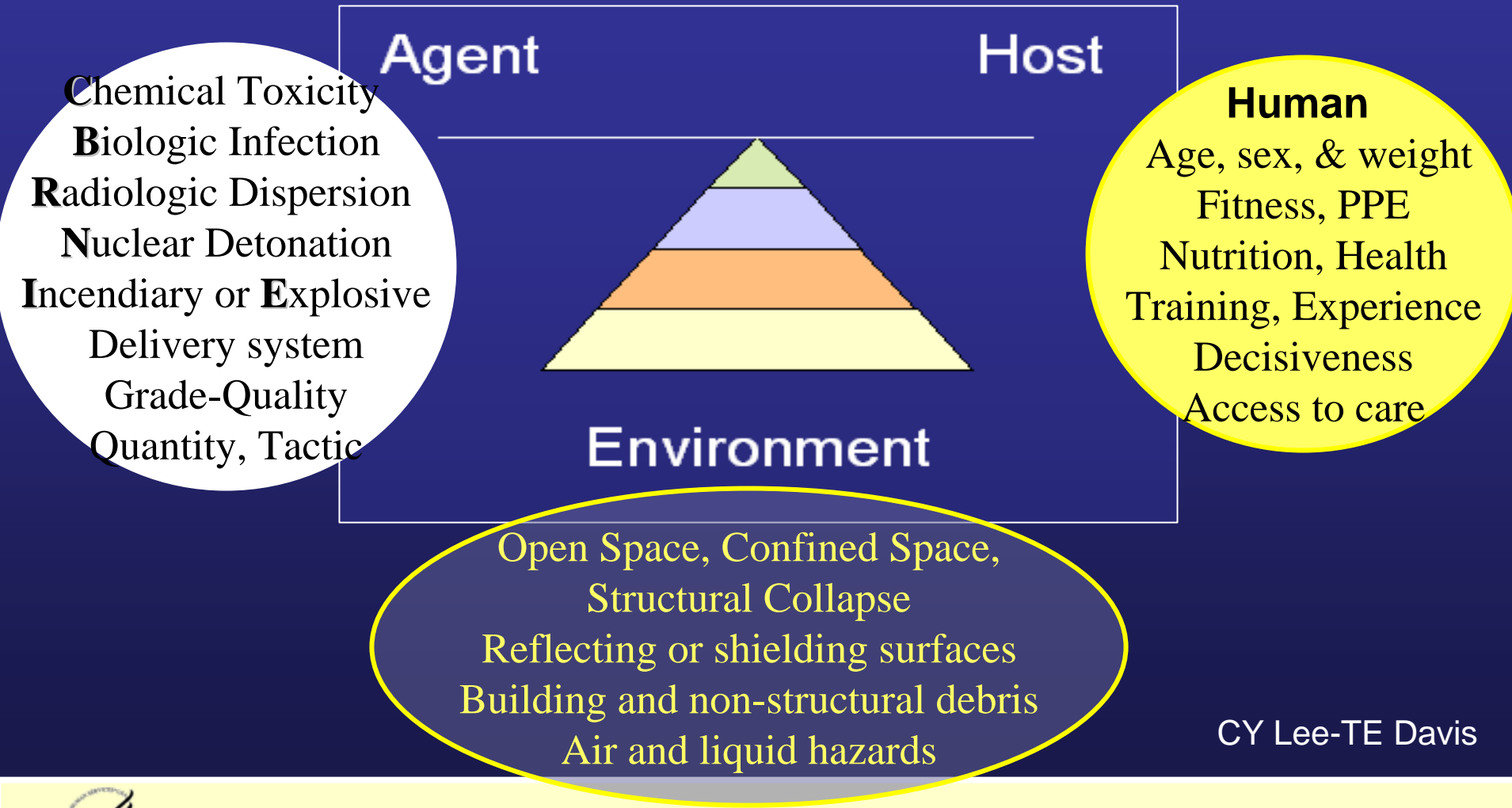
Orthopedic

Y Waisman, L Aharonson-Daniel, M Mor, L Amir, K Peleg



# CBRNE Threat Model

A public health approach to terrorism- remains standard routine shoe-leather epidemiology.



CY Lee-TE Davis



# Use of surveillance data – medical intelligence – to guide decision making



# Acute Clinicians

- Identify secondary events related to primary events
- May recognize an act of terror
- Suspect and assist with differentiating between something occurring naturally Vs. intentionally
- Medical intelligence is a part of homeland security



# Data Collection Method

- EMR – Tim, could you create a relevant slide or two on this?



# We Need Your information; They Need Your Help



**Your Data Lets us Support You!**



1/2008

# Common Operating Picture



# Summary

1. Expect predictable demand for basic care
  - based on historical patterns
  - **anticipate the unexpected**
  - use surveillance (medical intelligence) to improve the response
2. Manage your information -Report data timely to the IRCT, collaborate with HHS field teams
3. Assess Needs. Ensure Access. Keep communications open. Make decisions based on best available data. – Old public health disaster proverb
4. **You play a major role in identifying critical needs of the effected populations.**



# Case Study

