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Assessing the Emergency Impact

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Learning Outcomes

- Define roles in disasters response
- Understand Scene Safety
- Describe the actions needed in the first hours of a disaster
- Identify available local resources and how to mobilize them.
- Understand Team Based approach to disaster response
- Understand rural areas and islands are different
- Discuss the impact assessment when planning for a Mass Gathering Event

- The main mission of going to a disaster, is to save as many lives as you can!

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Managing the Crisis

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- High risk environment with little room for error
- Low frequency, high acuity event
- Trained for but rarely if ever performed
- Seconds to minutes to act

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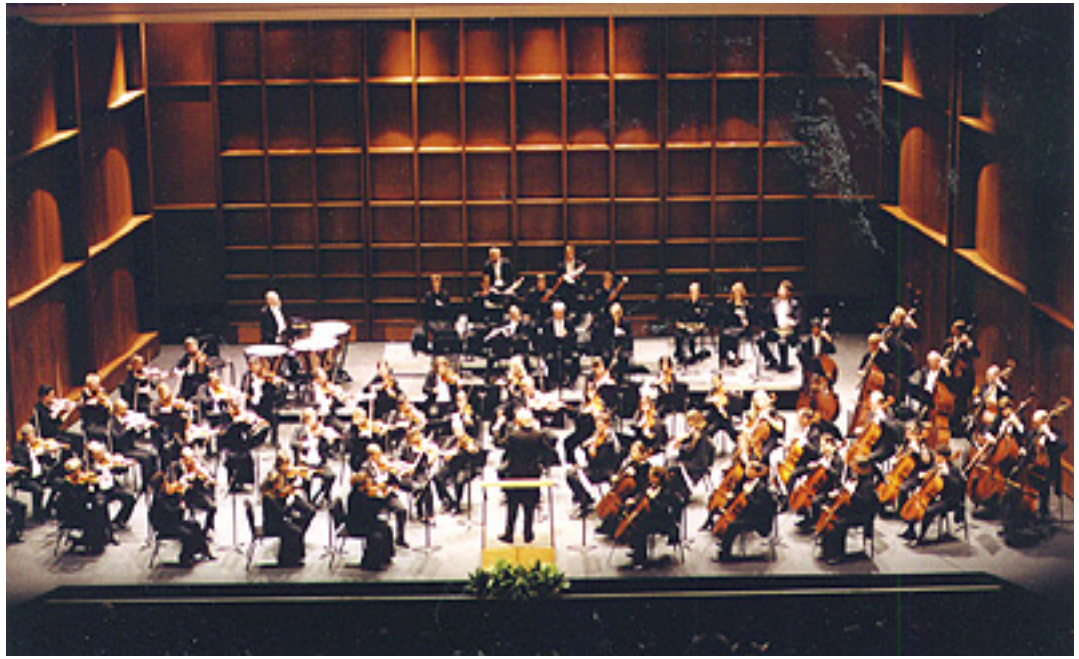
Goal In A Crisis



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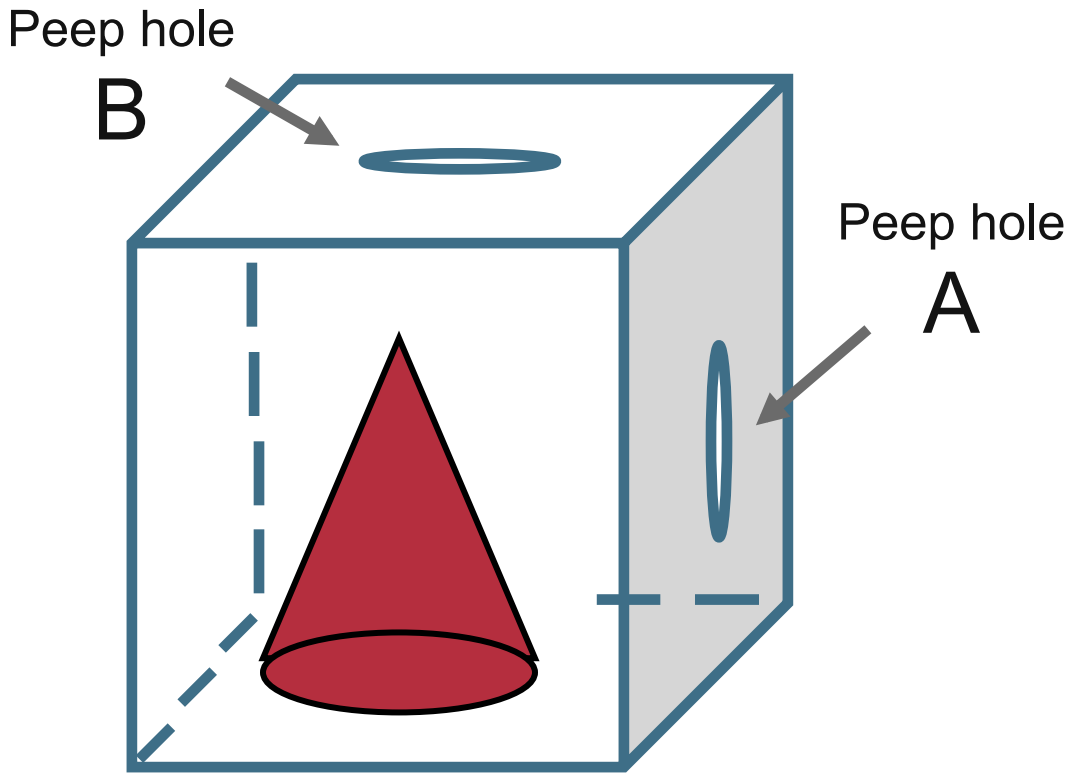
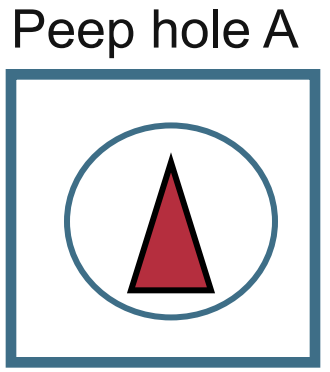
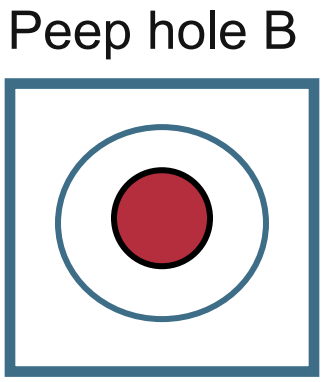
Situational Awareness: The Dilemma Of The Cube







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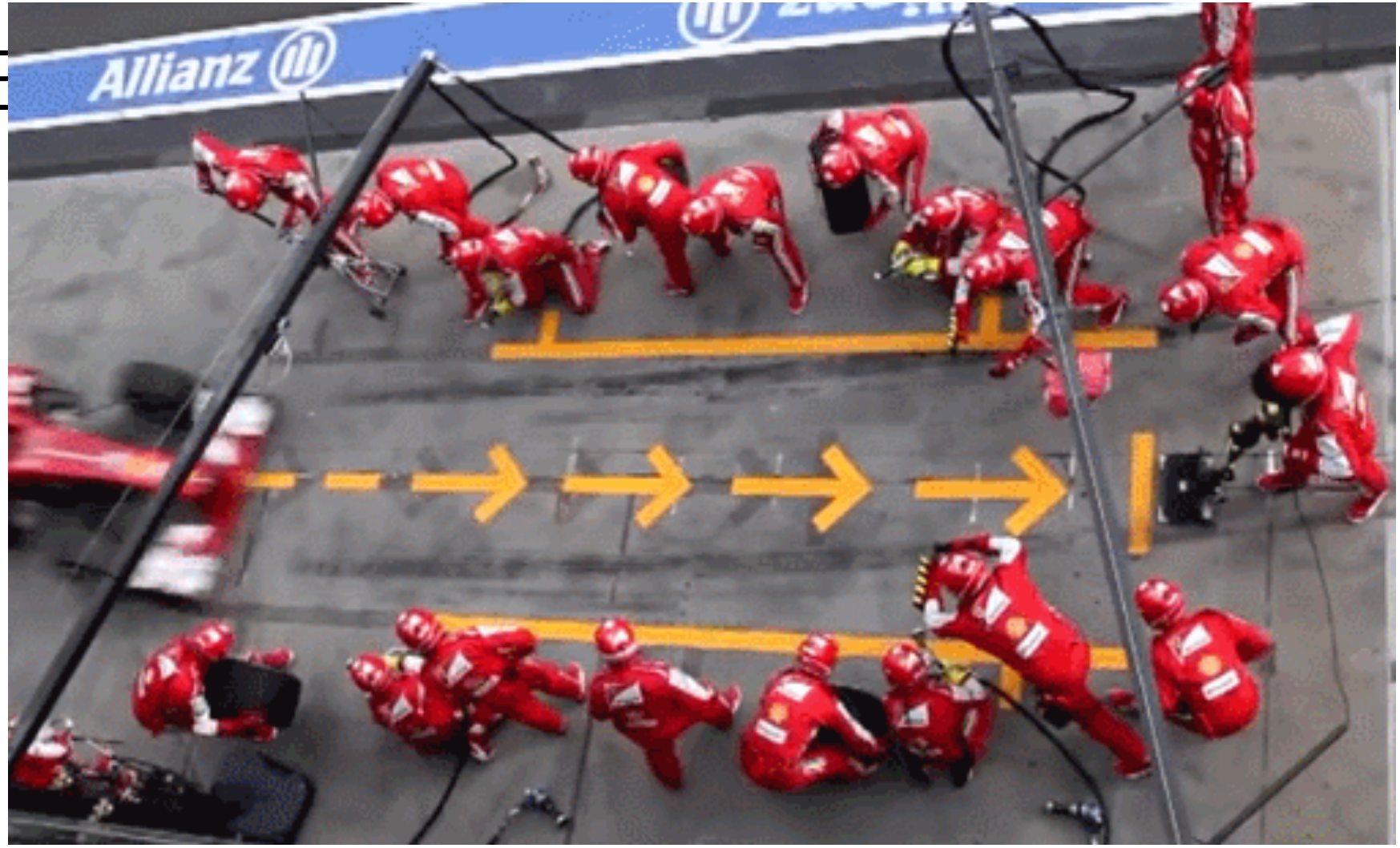

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Scene Safety: Oklahoma City Bombing

- A nurse not wearing appropriate protective clothing and a helmet was killed by head trauma from falling debris

TRAUMA HAZARD

World Trade Center

- Some physicians wore surgical scrubs and masks trying to walk through the dangerous debris
- Masks and respirators were only intermittently used
- Aftermath saw many with chronic respiratory problems

CHEMICAL HAZARD

Typical Hazards Seen in Disaster Scenes

- Falling debris/collapsing structures
- Unsafe ground
- Chemical hazards
- Dust
- Fire
- Violence
- Noise

Protective Equipment

- Head protection
  - Helmet based on risks
- Eye protection
- Ear protection
- Body protection
  - Types of protective equipment
- Hand protection
  - Types of gloves based on situation
- Foot protection
  - Use of steel-toed boots

Personal Protective Equipment

- Must be sufficient to protect against blood-born pathogens
- Must be capable of protecting against mechanical hazards such as falling debris
- Must protect against airborne chemicals, dust, contaminants
- Must be “wearable”


KING'S PRIDE


HOSES

Phases of Rescue Operations

- Rescue operations typically have five phases:
  - Assessment of the scene
  - Gaining access to the patient
  - Disentanglement of the patient
  - Removal of the patient
  - Emergency care and transport

Controlling the Scene

- Clear, delineated boundary of disaster scene
- Restricted Access: Police, Military
- ID's for credentialed responders
- Checkpoint for arriving assets
- Strictly-enforced PPE guidelines for entrance into disaster zone

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The Pre-hospital System is Crucial in Disaster

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Leadership in Disaster Response

- Disaster Management
- Preparedness Planning
- Coordinated Communication
- Resource Management
- Response Planning

Team Based Approach to Disaster Response

- In large scaled disaster response, the team approach is crucial to the success of the mission
- Response has to be scalable based on the
  - Local
  - State and Regional
  - Federal

Team Based Approach to Disaster Response

- Use of Non-Government Organ
  - Samaritan's Purse
  - Asian Foundation
  - The One Foundation
  - Narada Foundation

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Team Based Approach to Disaster Response

- Who makes up your teams?
  - Fire, EMS, Police
  - Hospital Personnel in Field
  - Citizen Response
  - Military
  - ? Volunteers

First Team Priorities on Arrival at Incident

- Command
- Safety
- Situational report
- Request resources
- Use of bystanders to help
- Extrication if needed
- Triage and treat casualties

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Do You Have a Plan to Make a Difference?

- Lives will be lost without a strong plan
- Time matters

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Training for Prehospital Response to Disasters

- How do you currently plan, train and execute for disaster response?
- Is it adequate?
- Does your training start at the top or bottom
  - Leadership to frontline providers
  - Are you testing every level of the response

Integration with Search and Rescue

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Teach Emergency Management at all levels of EMS

- Creates disaster plan based on hazard vulnerability analysis
- Becomes operational in a mass casualty incident
- Administrates a Regional Disaster Coordinating Center/Command Center
- Integrates advanced technology with practical applications
- Serves as focal point for mitigation/preparedness activities

EMS-Based Emergency Management

- Develop Disaster Plan
- Integrate into local and regional disaster operations
- Maintain equipment and training
- Develop and update EMS-based Incident Command structure
- HVA
- Operational Redundancy

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Enhanced Infrastructure Through Training

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Drills

Integrate Drills with Training

- Live DRILL
- Tabletop DRILL
- Intra-regional DRILL
- Inter-regional DRILL
- And then…..DRILL

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Why Does a Region Need Emergency Management?

Sarin Gas Attack, Tokyo 1995

- 5500 patients were injured
- Only 11 killed
- Closest hospital, St. Luke's, received 500 patients in the first hour and 641 patients the first day
- Sarin, an anticholinesterase, requires large quantities of atropine and 2-PAM

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Preparedness Based on Hazard Vulnerability Analysis

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HAZARD AND VULNERABILITY ASSESSMENT TOOL
HUMAN RELATED EVENTS

KAISER PERMANENTE

EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK
		HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	
	Likelihood this will occur	*Possibility of death or injury*	*Physical losses and damages*	*Interuption of services*	*Preplanning*	*Time, effectivness, resouces*	*Community/ Mutual Aid staff and supplies*	*Relative threat**
SCORE	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 - 100%*
Mass Casualty Incident (trauma)								0%
Mass Casualty Incident (medical/infectious)								0%
Terrorism, Biological								0%
VIP Situation								0%
Infant Abduction								0%
Hostage Situation								0%
Civil Disturbance								0%
Labor Action								0%
Forensic Admission								0%
Bomb Threat								0%
AVERAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%

**Threat increases with percentage.*

RISK = PROBABILITY * SEVERITY		
0.00	0.00	0.00

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Stockpile Equipment Based on Hazard Vulnerability Analysis

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Disaster Response is Challenging: One Size DOES NOT Fit All

Islands And Rural Areas Are Different

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You Can't Drive To Some Places: All Disasters Are Local!

- Evacuation
- Acute Phase Aid
- Displaced Populations
- Shelter in Place
- Post-Acute Phase needs
- Repatriation
- Reconstruction

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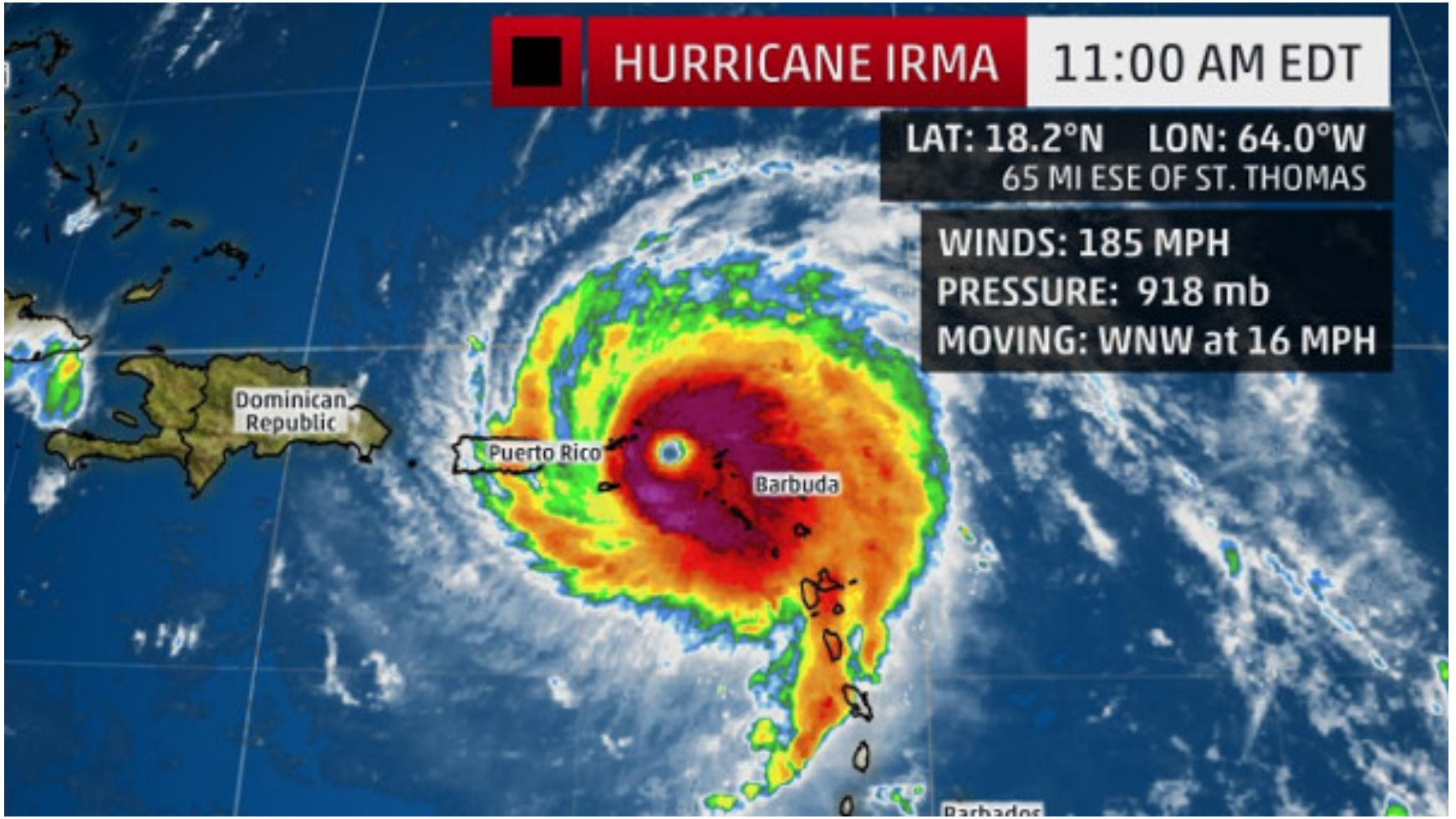
Mitigation, Preparedness, and Response in the Caribbean

- Planning
- Evacuation
- Acute casualty care
- Vulnerable Populations
- Shelter care
- Pharmaceuticals
- Chronic Care
- Restoration of healthcare infrastructure



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What About Mass Gathering Preparation?

The Issues

- Despite history, traditional planning concentrates on **normal operations** using patient presentation rates from comparable events
  - When an escalating event occurs, generally not prepared
  - Why?
    - Complacency, training, lack of time, lack of money
- Important to integrate MCI planning INTO the mass gathering preparation and planning

Preparing for Mass Gatherings AND MCI

- **Pre-assignment** of MCI leadership roles
  - Know ICS and what your specific role will be
  - Who will you report to?
  - Paperwork, liability, accountability
- **Pre-designation** of disaster communications channels
- **Coordination** with regional hospitals
- **Integration** of EMS tools and capabilities
- **Staging** of disaster supplies
- **Recognition** and mitigation of historic vulnerabilities
- **Preservation** of regional resources with physician-based treatment centers

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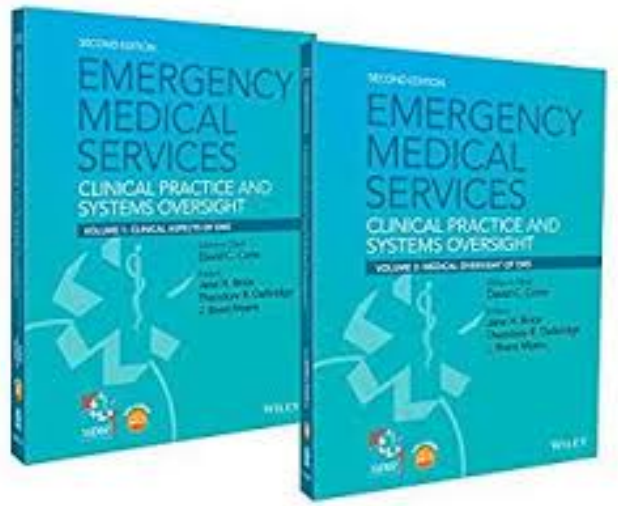
5 Areas of Risk Management and Planning Mitigation

- Soomaroo and Murray (2012):
  - 1) Overcrowding and crowd control
  - 2) Event access points
  - 3) Fire safety measures
  - 4) Medical preparedness
  - 5) Emergency response



- Soomaroo, L., & Murray, V. (2012). Disasters at mass gatherings: lessons from history. *PLoS currents*, *4*.

#1: Overcrowding and Crowd Control

- 1) Predictable Patterns of Behavior
  - In dense crowds, can't see
  - Can exacerbate a crowd crush with pushing behaviors
  - Stimuli can create a sudden surge → individuals fall and become crushed
- 2) Bottlenecks
  - Stairways, tunnels, turns, equipment, and stages create obstacles that impede traffic flow

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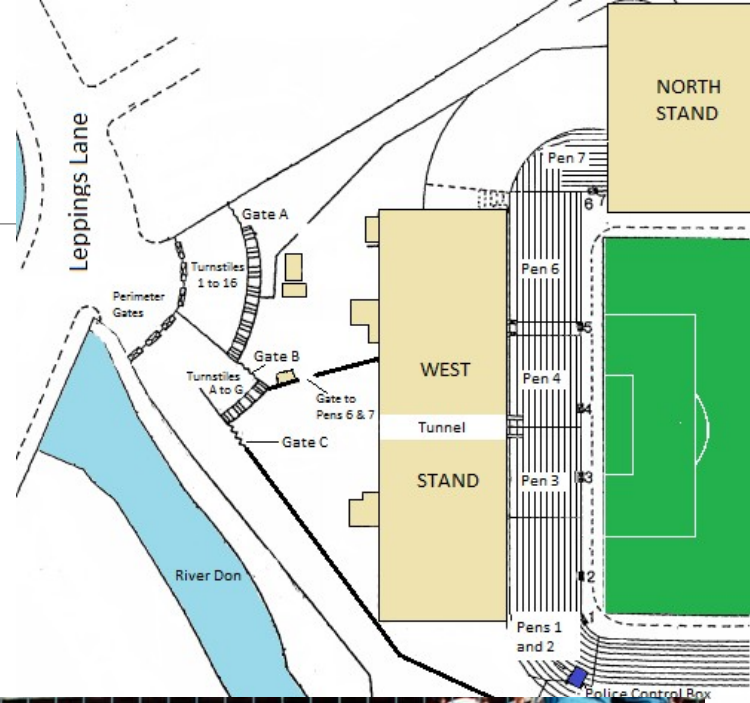
Hillsborough Disaster

- In Sheffield, England on 3/15/1989 during 1988 FA Cup semi-final between Liverpool and Nottingham Forest

- Occurred in two central pens
  - To ease overcrowding outside, police ordered an exit gate be opened at 2:52 pm, kickoff at 3pm
  - Lead to a sudden influx of **~2,000 supporters**
  - Trapped spectators w/ fences to their front and sides
  - Game stopped at 3:06pm

- 96 dead, 766 injured:
  - Remains one of the world's worst football disasters

- Led to safety improvements
  - Elimination of standing terraces
  - Removal of spectator fencing



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#2: Event Access Points

- Ticketed and Controlled Event Access Points
- Control # of attendees
- Provide additional security screening
- Access points used for **both** entrance and exit reduce traffic flows
- Adequate # of **clearly marked** emergency exits, not blocked

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#3: Robust Fire Safety, Prevention, Response Measures

- Strict enforcement of fire safety codes
- Set numbers of extinguishers
  - Be able to find them!
  - Know how to use them!

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#4: Medical Preparedness & #5: Emergency Response Planning

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- Help manage an event during normal operations
  - Know # and type of medical personnel needed based on historic patient presentation rates (PPR) at similar events under *normal* circumstances
- Prepare for escalating event
  - Preplan and Practice
    - **Repeat training exercises for all levels of response**
  - Ingress/Egress
    - Emergency access corridors must be protected for responders
  - Proper communications

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Overall KEY to Mitigation of MCIs at MGs = Proper Planning

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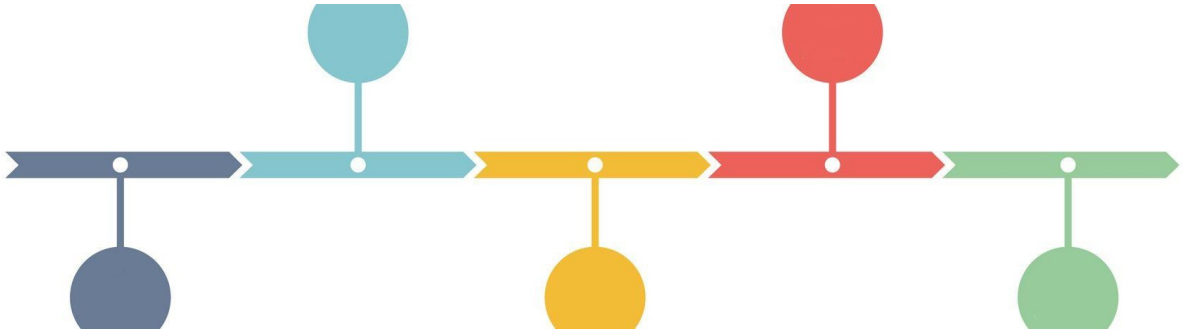

Timeline

- Divide into 1) Pre-planning, 2) Planning, 3) Operations, and 4) Post-event review
- 1) Pre-planning - Know type of event, expected attendance, dates and duration, agencies involved, transport modes, alcohol and drug policy, event history, geography
- 2) Planning - Preparation of site, personnel, and resources
- 3) Operations - Duration of the event
- 4) All should conclude with post event reviews

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Resources

- Depends on number of spectators and scale of events
- Factors that indicate higher level of resources
  - Crowd size
  - Age, event type, and environment
- Look at validated measures:
  - Patient Presentation Rate (PPR)
  - Medical usage rate (MUR) - percentage of patients per 10,000 persons in attendance
  - Recurring events benefit from prior experiences
- Some facilities have medical equipment, others do not
- No widely excepted standard list
- Also consider basic food, water, sanitation facilities, and sheltering

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Medical Plans

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- Should not place additional stress on existing EMS system
  - Keep event medical care separate
- Include staffing requirements, tx areas, BLS/ALS transport options, potential MCI plan
- Most events average 0.5-2 medical calls/1,000 spectators
  - 1 physician for 5,000-50,000 spectators
  - 1 nurse for 2,600 – 15,000 spectators
  - 1 EMT for 2,600-65,000 spectators
  - BLS/FR within 4 mins, ALS within 8 mins, transport to facility within 30 mins
- Review with event management and operations staff
- Approved 30 days prior to event

Types of Response Capabilities

- Medical care delivery sites can be grouped by capability, capacity, and mobility
- Well-established venues enable ED like capability
  - Stadiums, arenas, exhibit halls
  - Capability varies according to professional level of staff
  - Many tx and return to event
- Mobile stations: tents, mobile intensive care vans, field hospitals
  - Basic to advanced care
  - Need provisions for security, triage, staff work space, pt tx, staging for transport
  - Water, electricity, restrooms, waiting area, signage, climate control

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Environmental Factors

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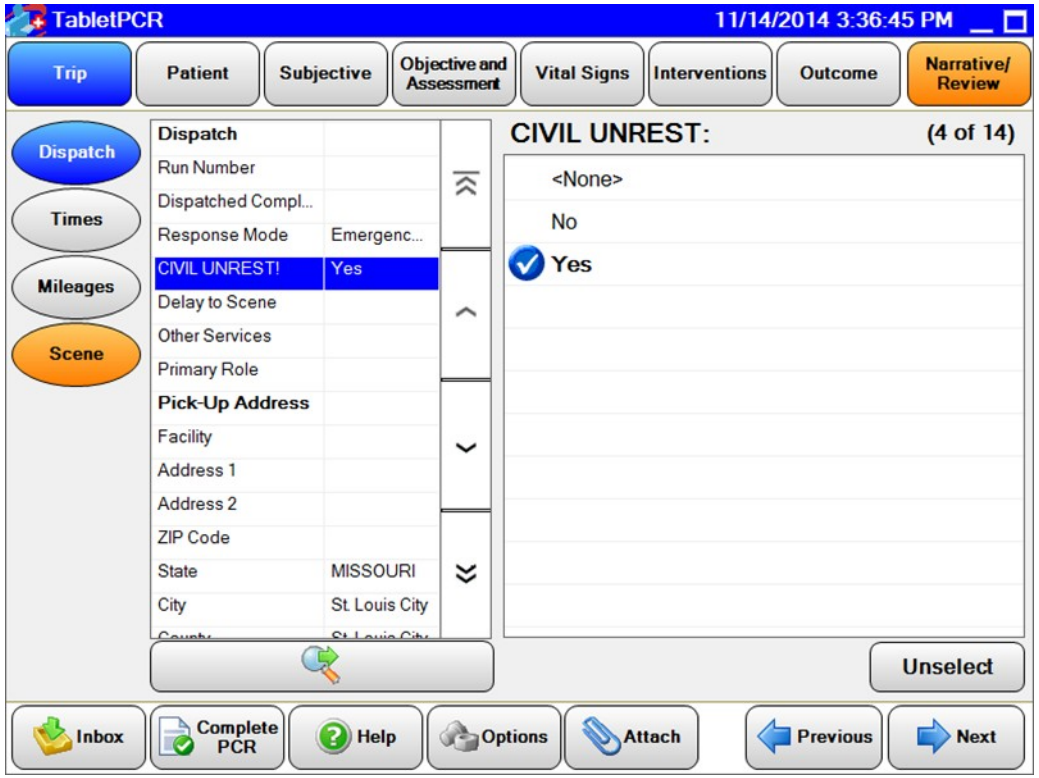
- Pre-event monitoring of weather predictions
  - Extreme cold/hot, wind, rain
  - Water, shade, fans, cooling centers
- Public health regulations for food prep, storage, waste removal
- Traffic routes and parking laid out prior to event
  - Special access for emergency medical vehicles
- Crowd disposition and atmosphere
  - Sports teams, mosh pits

Venue Review

- Complete site review during planning stage
- Identify # and accessibility of exits
- Hazard recognition
- Site mapping
- Evacuation routes
- Security personnel
- Venue specific plan for MCI – convert normal operations to disaster operations – TALK TO JOE Q PUBLIC!!

Documentation

- Standardized patient care record – paper or electronic
  - PCR is medical and legal record of care rendered
  - Will this form change in an MCI?
- Important for liability, equipment restocking, future event staffing, reimbursement



Communications

- Constant and accurate
- Prepare for complication or escalating situation during the event
- Direct communication from medical oversight to field providers
- Medical oversight have external contact with local EMS agency, fire dept, dispatch, emergency department
- Pre-established channels
- Social media

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Disaster Preparedness

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- Knowledge of ICS and predestination of roles
- Mutual aid for exceeding resources
- Finalize contracts before event

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Postevent Review

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- Debrief to address success and failures during event
- For recurring events: QI program
- After Action Review - ("lessons learned") session
- Identify areas of improvement for future events

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Questions