Best Practices/Lessons Learned:

2017 Hurricanes in Texas and Florida

The National Association of State EMS Officials works with State EMS Directors to document lessons learned and best practices from state-declared disasters. One of the tasks of the NASEMSO Health and Medical Preparedness Council is to provide assistance, when asked by the State/Territory EMS Director in a state-declared disaster. NASEMSO staff as well as other members of the Council works with the effected state as needed during the disaster and then conducts an after-action review to identify best practices and lessons learned. This document reflects findings from Hurricanes Harvey and Irma.

General Features:

The 2017 Hurricane season was unprecedented by the number of major hurricanes, damage to property, flooding and cost. 2017 ranked among the highest in terms of the number of major hurricanes with six hurricanes achieving Category 3 (130 mph winds) or higher. The National Weather Service defines a hurricane as "an intense tropical weather system with well-defined circulation and sustained winds of 74 mph (64 knots) or higher." The 2017 hurricane season began June 1 and ended November 30, 2017. Hurricanes Harvey and Irma also affected many states but this report is limited to Texas and Florida.

Summary of Events:

Hurricane Harvey made landfall in Rockport, Texas on the Texas coast on August 25, 2017 as a Category 4 hurricane with winds of 130 miles per hour; it lasted through August 30. The resulting

floods inundated hundreds of thousands of homes prompting more than 1700 rescues.

Additional information on the Texas response to Harvey:

- 7 (August 18) days out weather services reporting no impact to Texas.
- August 22 after evaluating the latest data, 6 Ambuses and 6 EMS Strike Teams placed on Stand-by.
- August 23, Weather service calling for a Cat 1 Hurricane, still undetermined whether and where the storm will impact Texas.
- August 24, 2 Ambuses and 3 EMS Strike Team moved to staging in San Antonio.
- August 24th morning, Storm jumped to Cat 4 impact is expected on Friday night August 25th.
- Deployed 13 additional EMS Strike Team, 12 of the 13 Ambuses.
- EMS started running missions as soon as resources entered staging area in San Antonio.
- August 25th (Friday night) made landfall in Rockport/Port Aransas Texas.
- August 25th, 12 noon, 300 patients evaluated, all resources pulled out due to high winds.
- Forecasts on the amount of rain started to increase
- August 25th, nighttime; requested 100 ambulances and 15 air ambulances from the National Ambulance Contract (NAC).

- August 26, additional 100 ambulances requested from the NAC for a total of 200 round ambulances and 25 air ambulances.
- August 27-28 heavy rain falling in Houston area, life safety mission throughout the area ongoing.
- Over 50 inches of rain in the Houston area.
- August 29-31 rain continued, second land fall Texas and Louisiana line, the storm was a named storm for 5 days.
- September 3, started demobilization of Federal resources to move to Florida.
- EMS Facts of event:
    1. 1700 IPhones used for tracking of ESF 8 resources (11 million messages provided to work force).
    2. 3 major operation sites, Rockport/Port Aransas, Houston and Beaumont Texas.
    3. 250 Texas Emergency Medical Task Force (EMTF) resources used.
    4. 1855 patients' scene at Mobile Medical Unit (MMU).
    5. 20 EMS Strike Teams.
    6. 13 Ambuses.
    7. 25 air ambulances through the NAC.
    8. 200 Ambulances through the NAC.
    9. 990 missions.
    10. 3200 personnel.

Hurricane Irma hit the Florida Keys on September 10, 2017 as a Category 4 with winds of 130 miles per hour and then hit the mainland on September 10 as a Category 3. Hurricane Irma was

the strongest Atlantic based hurricane ever recorded outside the Gulf of Mexico and the Caribbean Sea.

From the state EMS office, additional information is as follows:

- Aug 30 – Initial formation was on of Tropical Storm.
- Aug 31 – initially a Cat 2 then Cat 5 on September 5th.
- September 4 – Level 1 Activation 24 hours State EOC activation when Cat 2.
- Reports potential of a Cat 5 to hit Miami with 175 mile winds.
- Potential Cat 5 to hit the entire state.
- September 6 – Emergency Medical Assistance Compact (EMAC) request for EMS resources.
- September 7 – Requests 100 FEMA Ambulances (20 Ambulance Strike Teams (AST)) (already staged in Tallahassee) through the National Ambulance Contract.
- September 8 – (30 Ambulances/6 ASTs) Tennessee EMAC arrive.
- September 9 – (10 Ambulances/2 ASTs) Kentucky EMAC arrived.
- No ability to stage resources due to the size of the storm covering the entire state.
- September 10th – Hurricane Irma made 2 Landfalls: Keys and Marco Island.
- September 11 – Second 100 FEMA ambulances 144 Paratransit vehicles requested on (staged in Orlando).
- September 13 – Relocated resources to Boca Raton.
- There were 533 ESF-8 Missions 72 were for patient movement missions for Irma.

Three consecutive Hurricane events Irma, Maria, and Nate that required state EOC activation.

Strength of Response/Best Practices: Hurricane Harvey and Irma:

- iPhone for tracking resources.
- Local, State and Federal personnel working together.
- National Ambulance Contract.
- Federal Partners.
- Cell coverage remained in service.
- Years of preparing for a major storm was beneficial to the overall responses. Advance teams sent to hospital for evaluation before sending resources.
- Repairs service available for response vehicles.
- National Association of EMS Officials (NASEMSO) and National Registry for Emergency Medical Technicians (NREMT) sending out information to their contacts about EMS personnel not to self-deploy.
- Ongoing communication with NASESMO offering support and assistance.
- The ESF-8 Patient Movement Branch was given the flexibility to make operational decisions without having to go through several layers of approval.
- EMAC.
- Right People in the operation centers such as the Agency for Health Care Administration (AHCA), the Florida Hospital Association (FHA), Nursing Home administration.
- FlaHealth STAT provided bed availability to help with patient movement.

- Additional Paratransit vehicles process.
- Strong support of local leadership without micro managing local missions.
- Opened state buildings to families and pets for shelter.

Lessons Learned/Areas of Improvement: Hurricanes Harvey and Irma:

- It's important to maintain pre-staged equipment set-up as original completed. This will reduce the need to reorient staff to the asset.
- Patient tracking is still an issue.
- Short time to get resources in place pre-storm.
- Patients coming to mobile medical units before ready.
- Employers need to plan on back filling positions when their staff are involved in a deployment.
- Elected officials need to know how long resources are staying in place.
- Narcotics refills process needs to be enhanced.
- The ability to increase the size of staging area must be considered.
- Personnel resources know who to report to when relocating.
- More depth is needed in communication plans, including an air ambulance plan.
- Plan for the storm effect on first responder's homes and family.
- Need to assure on-going communication with Emergency personnel to assure that they know the full effect of the storm on the whole state.

- Portable potty/trash cans for staff in the first response wave.
- Security planning needs to be enhanced.
- When personnel are swapped out make sure you are replacing the person with the same skilled level of person.
- Air rescue dropping uninjured people at hospitals.
- Education on the different between relocating and demobilization.
- National Ambulance Contract is not set up for Critical Care Transports.
- Staging vehicles need to consider the exhaust from vehicles that are parked next to each other.
- O2 was needed for shelters.
- AMR's tracking of deployed resources must be improved.
- Education on FEMA reimbursement and how to estimate salaries.
- No standard reimbursement model between states for EMS transports or services.
- Need better planning for EMS vehicles to be able to get gasoline during fuel shortage.
- Need better planning for traffic congestion during patient movements in order to assure that ambulances can get patients to hospitals.
- ESF-8 Patient Movement Branches should be involved in EMAC Planning.
- State EM Software overwhelmed.
- Ambulance Deployment Plan need to reflect the reality of interfacility transports with private services.
- More education on the use of military personnel and resources.

- Communication and follow through with logistics to move 200 ambulances.
- Mission input confusing by locals.

Additional Considerations/Unresolved issues:

- Need to remember to continue to monitor social media.
- Storm impact on mental health of responding personnel and families.
- Storm impact on responder's homes and personal resources.
- Social Media friend or foe?
- Identify way to track resources.
- Egress and Ingress for ambulances especially when changes are made to highways due to evacuation including getting strike teams from one part of the state to another.
- What to do with self-deployment by non-requested resources and personnel.
- Best system to use for patient tracking.

Contact
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