

# ASPR TRACIE Technical Assistance Request

**Requestor:**

**Requestor Phone:**

**Requestor Email:**

**Request Receipt Date (by ASPR TRACIE):** 16 August 2016

**Response Date:** 23 August 2016

**Type of TA Request:** Standard

## Request:

██████ is requesting any flooding topic collections or resources that have best practices for hospitals.

## Response:

ASPR TRACIE has a number of resources that may be helpful to jurisdictions currently experiencing flooding and those jurisdictions planning for flooding or flood-related health issues.

- The [Natural Disasters](#) Topic Collection includes a section on [Flooding – Lessons Learned](#) and [Flooding – Plans, Tools, and Templates](#).
- We have numerous [individual resources on flooding](#) in our Resource Library, which is also connected to the National Library of Medicine Disaster Lit database.
- The following redacted responses to technical assistance requests are available on the Information Exchange Flooding Resources Topic and also attached for convenience.
  - [ASPR TRACIE Hurricane: Resources At Your Fingertips document](#)
  - [El Nino Health Effects TA Response](#)
  - [Public Messaging on Mold TA Response](#)

Section I below includes an excerpt of resources that are most applicable to hospitals.

## I. Flooding Resources for Hospitals

Apisarntharak, A., Mundy, L., Khawcharoenporn, T., et al. (2013). [Hospital Infection Prevention and Control Issues Relevant to Extensive Floods](#). (Must login to JSTOR to retrieve full article). *Infection Control and Hospital Epidemiology*. 34(2): 200-206.

In this article, the authors discuss infection prevention and control experiences related to the reopening of medical facilities after recent disasters in Thailand and the U.S.

Bandino, J.P., Hang, A., and Norton, S.A. (2015). [The Infectious and Noninfectious Dermatological Consequences of Flooding: A Field Manual for the Responding Provider](#). *American Journal of Clinical Dermatology*. 16(5): 399-424.

The authors provide information for clinicians caring for flood victims. They describe the conditions seen in patients following floods, and characterize the causative agents of these conditions. Treatment is also discussed.

Kshirsagar, N., Shinde R., and Mehta, S. (2006). [Floods in Mumbai: Impact of Public Health Service by Hospital Staff and Medical Students.](#) *Journal of Postgraduate Medicine.* 52(4): 312-314.

This article discusses the impact of the Mumbai floods and the provision of shelter-based and community care for over 150,000 cases of diarrhea, many consistent with leptospirosis by hospital staff and medical students, detailing the substantially increased risk of communicable disease during flooding events with poor sanitary conditions.

Shroades, R. (2007). [Flood Preparedness: Once Bitten, Twice Ready.](#) *Facility Maintenance Decisions.*

This article documents how facility staff from Memorial Hermann Hospital incorporated lessons learned after Tropical Storm Allison flooded the facility with almost 40 feet of water in 2001.

Barkemeyer, B. (2006). [Practicing Neonatology in a Blackout: The University Hospital NICU in the Midst of Hurricane Katrina: Caring for Children Without Power or Water.](#) *Pediatrics.* 117(Suppl. 4):S369 -S374.

The author recounts the challenges associated with providing care in a university hospital's neonatal intensive care unit before, during, and after Hurricane Katrina made landfall.

Berggren, R. (2005). [Hurricane Katrina. Unexpected Necessities--Inside Charity Hospital.](#) *The New England Journal of Medicine.* 353(15):1550-3.

The author describes her experience in Charity Hospital following Hurricane Katrina, with a focus on the unexpected necessities (e.g., shoes, extra underwear, shift work/sleep, morale-boosting activities, a team of professionals who care about patients and each other, etc.) that arose, and how they were addressed.

Brevard, S.B., Weintraub, S.L., Aiken, J.B., et al. (2008). [Analysis of Disaster Response Plans and The Aftermath of Hurricane Katrina: Lessons Learned From a Level I Trauma Center.](#) (Abstract only.) *The Journal of Trauma.* 65(5):1126-32.

The authors retrospectively reviewed their hospital's disaster plan and compared it with actual events that occurred after Hurricane Katrina. They evaluated and scored vital support areas as adequate (3 pts), partially adequate (2 pts), or inadequate (1 pt), with the following results: water-3.0, food-2.4, sanitation-1.5, communication-1.4, and power-1.5. The authors concluded that, despite writing and exercising plans, the hospital was still not fully prepared.

Horahan, K., Morchel, H., Raheem, M., and Stevens, L. (2014). [Electronic Health Records Access During a Disaster.](#) *Online Journal of Public Health Informatics.* 5(3):232.

The authors describe a novel approach to reestablishing connectivity with the electronic

health records server for a hospital affected by Superstorm Sandy through resource-sharing of a disaster response asset from a hospital in a neighboring state.

Louisiana State University Health Sciences Center. (2010). [External Flood Prevention Plan](#). Campus Wide/Hospital Safety Manual.

This plan was designed to help prevent floodwaters from entering the ground floor of the medical school and hospital and can be used by medical facility planners faced with similar challenges.

Low, D., Mahadevia, A., Perotin, M., et al. (2013). [Flood Proofing Non-Residential Buildings](#). Federal Emergency Management Agency.

This guidance document includes two hospital-specific case studies that illustrate the successful use of floodwalls.

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Mitchell, L., Anderle, D., Nastally, K., et al. (2009). [Lessons Learned from Hurricane Ike](#). (Abstract only.) AORN Journal. 89(6):1073-8.

The authors describe how their hospital system's response plans were revised after Hurricane Rita in anticipation of Hurricane Ike in 2008. They note that, despite planning and exercising their plan, there were still a number of lessons learned that could be helpful to other hospitals during future disaster responses.

Okie, S. (2008). [Dr. Pou and the Hurricane — Implications for Patient Care during Disasters](#). The New England Journal of Medicine. 358(1):1-5.

The author discusses the circumstances surrounding the arrest of a physician and two nurses for allegedly euthanizing four elderly patients at Memorial Hospital in Louisiana after Hurricane Katrina. Issues such as altered standards of care, scarce resource allocation, triage, and indemnification and/or immunity for health professionals are included.

Pereira, B., Morales W., Cardoso, R., et al. (2013). [Lessons Learned From a Landslide Catastrophe in Rio de Janeiro, Brazil](#). American Journal of Disaster Medicine. 8(4):253-8.

The authors discuss lessons learned from this flood and landslide event in 2011, with a focus on pre-hospital and hospital organization and management of patients. They also describe the most common injuries treated (injuries were to the extremities, most requiring only wound cleaning, debridement, and suture), and note that the primary cause of death was from asphyxia due to drowning or mud burial.

Redlener, I. and Reilly, M. (2012). [Lessons from Sandy — Preparing Health Systems for Future Disasters](#). National Center for Disaster Preparedness, Mailman School of Public Health, Columbia University, New York.

This article discusses lessons learned from the evacuation of two NYC area hospitals in response to Hurricane Sandy in 2012.

Rosen, Y. and Yakubov, N. (2013). [Hurricane Sandy: Lessons Learned from the Severely Damaged Coney Island Hospital.](#) (First page only.) Pre-hospital and Disaster Medicine. 28(6):643.

The authors discuss the challenges and benefits of transferring their patients to other hospitals along with their care teams in preparation for, and following Hurricane Sandy.

World Health Organization, Regional Office for Europe. (2014). [Floods and Health: Fact Sheets for Health Professionals.](#)

These fact sheets are geared towards health professionals and describe steps to take during a flood, in the absence of a flood health preparedness and response plan. The sheets cover a variety of strategies including: vaccination during flood events, food safety, water and hygiene in healthcare facilities during and after flood events, and post flood disinfection strategies.

Verni, C. (2012). [A Hospital System's Response to a Hurricane Offers Lessons, Including the Need for Mandatory Interfacility Drills.](#) Health Affairs. (8):1814-21.

This case study explores the lessons learned when the North Shore-Long Island Jewish Health System evacuated three hospitals at high risk of flooding from Hurricane Irene in August 2011. The event resulted in the evacuation, transport, and placement of 947 patients without any resulting deaths or serious injuries. This case demonstrates the utility of having a functional evacuation plan in place, such as the one North Shore-Long Island Jewish Health System developed through its own full-scale exercises in the years following Hurricane Katrina in 2005.