



## HHS/FEMA Joint Health Advisory for Responders<sup>1</sup>

September 2, 2017

**TO: HHS and FEMA personnel deployed in response to Hurricane Harvey**

**SUBJECT: Floodwater Associated Health Risks to the Workforce**

### Background

The impact of Hurricane Harvey has resulted in severe flooding in Texas and in parts of neighboring Louisiana. Storm and flood cleanup activities can be hazardous. Prior hurricane cleanup and recovery efforts, such as those following Hurricanes Sandy and Katrina, have provided valuable lessons that supervisors should consider in protecting the DHS workforce involved in response efforts in Texas. Workers and volunteers involved with flood response and recovery should be aware of the potential dangers involved and take proper precautions to avoid associated health and safety risks.

### Risk to Workforce in Texas and Louisiana

Work-related hazards that could be encountered in severely flooded areas are numerous and diverse, examples include:

- Direct risks from high and or moving water
- Electrical hazards
- Carbon monoxide poisoning
- Musculoskeletal hazards
- Heat/cold stress
- Motor vehicle accidents
- Hazardous materials
- Fires/burns
- Confined spaces
- Contaminated standing water
- Uncontained sewage
- Falls

Comprehensive information about hazards associated with storm and flood cleanup can be found on the National Institute for Occupational Safety and Health (NIOSH) site at <http://www.cdc.gov/niosh/topics/emres/flood.html>. This information is intended to help employers and workers prevent work-related injuries and illnesses in the field during rescue, recovery, and clean-up operations.

### Standing and Flood Water Precautions

Standing and floodwaters pose various health risks. Awareness of these risks can help prevent injuries and illness.

---

<sup>1</sup> Adapted from interim guidance from the DHS Office of Health Affairs

- Any time you have floodwater, particularly standing water, the water can contain any number of bacteria or viruses. The water may be contaminated with gastrointestinal hazards, such as norovirus, or rarer, more serious bacteria such as those that can cause serious wound infections.
- Sharp and other hidden objects under water may result in punctures, lacerations, abrasions, and other serious injuries (blood vessels, muscles, bones, joints, etc.). Wear protective footwear and appropriate work clothing at all times.
- Any open wounds suffered from an object contaminated with floodwater should be rinsed with clean water and evaluated by a medical professional. Report any injuries immediately to the onsite force health protection officer.
- Following exposure to flood water, skin rashes may occur due to minor contaminants, chaffing, or other irritants.
- If exposed to flood waters, shower as soon as possible, change into dry clothes and keep rash clean and dry. If rash persists or spreads, seek medical attention.
- At the end of your shift, shower with soap and clean water, change into clean clothes, and air-dry feet.

**Animals, Vectors, and Other Insects:** Standing and floodwaters can displace animals and insects. Stay alert of your surroundings and avoid contact. Standing water provides prime breeding grounds for mosquitoes. At this time, there is no mosquito-borne Zika threat in Texas or Louisiana. However, local Texas Public Health has instituted enhanced Zika testing and surveillance in nine-counties that are at higher risk of Zika due to climate and geography. These nine Texas counties are Cameron, Hidalgo, Starr, Webb, Willacy, Zapata, Kinney, Maverick, and Val Verde. Local Texas Public Health officials continue to encourage mosquito-bite prevention precautions due to risk of West Nile Virus, Zika, and Chikungunya. Louisiana has reported past cases of West Nile virus, St. Louis Encephalitis, Eastern Equine Encephalitis, and La Crosse Encephalitis. These viral infections are rare and result in mild flu-like symptoms but some people can become severely ill or die.

**Chemicals:** Standing and floodwater may be contaminated by household and industrial chemicals, pesticides and other hazardous material which may cause skin, eye, or inhalation irritation. If you are working in standing and floodwater, wear personal protective equipment such as gloves and boots. Wash eyes with clean water for 20 minutes if you experience eye irritation; wash skin with soap and clean water if spot skin irritation is noted. Shower and change into clean clothes if whole-body irritation is experienced. Notify the onsite force health protection safety officer and seek medical attention as soon as possible.

**Diarrheal Disease:** Eating or drinking anything contaminated by floodwater can cause diarrheal disease. Wash hands with soap and clean water before eating or handling food after contact with floodwaters.

**Drowning:** Regardless of swimming abilities, floodwater poses drowning risks for everyone. Swiftly moving shallow water can be deadly. Do not attempt to swim in moving floodwaters. Vehicles do not provide adequate protection from floodwaters. They can be swept away or may stall in moving water.

**Infection:** Standing water can be a source of infection and may contain sharps and hazardous chemicals that pose additional health risks. Open wounds and rashes exposed to flood waters can become infected. To prevent wound infections, avoid exposure to flood waters if you have an open wound or cover wounds with a waterproof bandage. Keep open wounds as clean as

possible by washing well with soap and clean water. If a wound develops redness, swelling, or drainage, seek immediate medical attention.

**Trench foot:** Trench foot, also known as immersion foot, occurs when the feet are wet for long periods of time and can be quite painful. To prevent trench foot, when possible, air-dry and elevate feet and change into dry socks and shoes. Early signs and symptoms include tingling and/or itching sensation, pain, swelling, cold and blotchy skin, numbness, and a prickly or heavy feeling in the foot. If left untreated, blisters and skin or tissue death may follow. Thoroughly clean and dry your feet and put on clean, dry socks daily. Treat the affected part by applying warm packs or soaking in warm water (102° to 110° F) for approximately 5 minutes. When sleeping or resting, do not wear socks, and seek immediate medical attention.

### **Austere Environmental Considerations**

When responding to a disaster site the environmental conditions should also be considered as they may negatively affect the health of the responder. An austere working environment may include:

- Ongoing weather/environmental threats (e.g. heat, cold, storms, wind, or altitude)
- Standing contaminated water and sewage
- Limited availability of reliable electrical power, transportation, medical supplies, technologies, resources, or expertise
- Limited communications, including little to no access to medical direction or oversight
- Limited capacity to provide care due to lack of safe environment
- Unscheduled meals, rotating shifts, and/or extended work hours

Austere environments may cause an individual to experience acute operational stress symptoms that can be both physical and behavioral health in nature. These environments and related missions may also exacerbate pre-existing conditions. Disaster response employees should be in good health with current adult immunizations recommended by the Centers for Disease Control and Prevention (CDC). In addition, certain job series may require additional immunizations such as Hepatitis B for healthcare workers, or Hepatitis A for workers with the potential exposure to raw sewage. Pregnant employees, depending on their duty assignment, can have additional risks and should consult with their private obstetrician before deploying to any austere environments.

Safety and health concerns should be reported to the onsite force health protection safety officer immediately.

### **References:**

1. CDC: Storm, Flood, and Hurricane Response. Retrieved 8/28/2017 from <http://www.cdc.gov/niosh/topics/emres/flood.html>
2. CDC: Flood Waters or Standing Waters. Retrieved 8/28/2017 from <http://www.cdc.gov/healthywater/emergency/extreme-weather/floods-standingwater.html>
3. OSHA Fact Sheet: Keeping Workers Safe during Hurricane Sandy Cleanup and Recovery. Retrieved 8/28/2017 from [https://www.osha.gov/Publications/OSHA\\_FS-3610.pdf](https://www.osha.gov/Publications/OSHA_FS-3610.pdf)
4. Texas Health and Human Service: Zika in Texas. Retrieved 8/28/2017 from <http://www.texaszika.org/index.htm>
5. Texas Department of Public Safety: Texas Mosquito-borne Disease Awareness and Prevention. Retrieved 8/28/2017 from <https://www.dps.texas.gov/dem/Preparedness/tips/westNile.htm>
6. Louisiana Department of Health: Community and Preventive Health-West Nile Virus. Retrieved 8/28/2017 from <http://new.dhh.louisiana.gov/index.cfm/page/539>