

Extreme Weather and Healthcare: Lessons Learned and Considerations for the Future



the E **X** CHANGE

ASPR
ADMINISTRATION FOR STRATEGIC
PREPAREDNESS AND RESPONSE



TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS
INFORMATION GATEWAY

FOREWORD

It is officially hurricane season, and time for healthcare facilities in those states at most risk to begin reviewing their plans to ensure they are as prepared as possible to manage threats to their operations. Recent events have illustrated, however, that the threat extreme weather poses to the U.S. is not limited to just those states or to storms with names. Climate change has contributed to unprecedented weather events—including extreme heat, floods, and tornadic activity—in areas that have historically not been subject to these types of hazards. Together with ASPR, the Office of the Assistant Secretary for Health's [Office of Climate Change and Health Equity](#) (OCCHE) encourages you to review your local forecasts (including our [Climate and Health Outlook](#)), facility resilience and evacuation plans, and memoranda of understanding to ensure you and your colleagues are as prepared as possible for summertime's extreme weather hazards such as heat stress, burns and other injuries related to extreme heat; flooding, utility outages, and other infrastructure failures associated with severe precipitation events (e.g., hurricanes). It is important to remember that many of these disasters can coincide and compound each other.

The articles [in this issue](#) can help our stakeholders do just that. One focuses on the experiences and lessons learned by a hospital in central Vermont during an historic flash flood in 2023. The next author describes the regional burn treatment landscape and encourages healthcare providers to prepare to treat burn injuries as a result of extreme heat events and wildfires. The next article provides a brief overview of injuries and illnesses treated in 2023 after the wildfires in Hawaii and extreme heat in Arizona and Nevada; links to burn planning resources are provided. This issue closes with an overview of OCCHE and our focus on working with federal partners to bolster healthcare infrastructure and community resilience.

ASPR has been busy working on the updated National Health Care Preparedness and Response Capabilities. I encourage you to monitor the [Office of Health Care Readiness](#) for the updates and ASPR TRACIE for related webinars.

[ASPR TRACIE](#) develops resources in conjunction with partners, stakeholders, and other subject matter experts who have direct experience in the field. [Please share](#) your own promising practices, experiences, or requests for technical assistance so that others may learn from you. As always, we welcome your feedback.



Dr. John Balbus

Director of the Office of Climate Change and Health Equity and Deputy Assistant Secretary for Climate Change and Health Equity

WELCOME TO ISSUE 19!

The [last issue of *The Exchange*](#) focused on innovations in healthcare surge capacity management (with articles on the state of Washington's experience with the "tripledemic" that affected children across the U.S. in the winter of 2022-2023; the history and evolution of the Southwest Texas Regional Advisory Council with a focus on their efforts to load-balance patients during various incidents; the unique characteristics and challenges faced by Imperial County, CA and how tents and the use of an alternate care site supported patient care during the pandemic; and the experiences of a Navajo Area Indian Health Service hospital as they worked around the clock to locate appropriate receiving facilities and provided care in place while simultaneously managing staffing shortages). In April 2024, [the U.S. was struck with both heavy snow and more than 100 tornadoes](#). On the 26th, the National Weather Service in Omaha issued the most tornado warnings in a single day. In this issue, we shift our focus to planning and responding to extreme weather events from local, regional, and federal perspectives.

[ASPR TRACIE](#) has had the honor of working with healthcare workers and other subject matter experts (SMEs) to gather and share timely information for nearly 10 years. Our team has witnessed the impact of extreme weather on our stakeholders across the nation, and we hope that the lessons learned and preparedness, mitigation, and response strategies highlighted in these articles can help readers bolster facility, staff, and community resilience.

Please refer to our updated [Medical Operations Coordination Centers Toolkit \(Version 3.0\)](#) (which features a [new appendix that provides pediatric considerations](#)), our updated [Avian Influenza Quick Facts document](#), and our speaker series recording on the [Response to the Bryce Canyon Tour Bus Mass Casualty Incident](#). Your feedback is what makes us successful—please [contact us](#) with your comments, questions, technical assistance needs, and resources to share. We look forward to our continued collaboration.

Wishing you a safe, healthy summer!

Rachel Lehman, Acting Director, ASPR TRACIE

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AT A GLANCE

5 [Supporting the Community through Historic Flooding: Central Vermont Medical Center's 2023 Experience](#)

The state of Vermont experienced significant flooding in July 2023, when already soaked soil received 3-5 inches of rain on July 7 followed by up to seven inches of rain in some areas between July 9-11. Anna Tempesta Noonan, President and Chief Operating Officer of the University of Vermont Health Network-Central Vermont Medical Center, met with ASPR TRACIE to share how the facility remained open and continued to serve the community during this historic weather event.

6 [Hot Spots: Reflecting on the Summer of 2023](#)

This article provides a snapshot of burns and heat-related illness in the summer of 2023 and links to related ASPR TRACIE resources that can help readers prepare for extreme heat events and wildfires.

7 [Extreme Weather and Healthcare – Are you Ready for a Burn Disaster?](#)

Annette Newman provides an overview of North American burn disaster regions and related organizations and highlights the importance of planning and exercising for burn mass casualty incidents, emphasizing the role of telehealth and burn triage.

9 [Climate Resilience and Mitigation: The Federal Perspective](#)

The Office of Climate Change and Health Equity (OCCHE) was established On August 31, 2021, under the direction of the U.S. Department of Health and Human Services Assistant Secretary for Health. ASPR TRACIE met with Dr. John Balbus (Director of OCCHE and Deputy Assistant Secretary for Climate Change and Health Equity) and Dr. Aparna Bole (Pediatrician, Senior Consultant with OCCHE, and Special Expert, Office of the Director, Agency for Healthcare Research and Quality) to learn more about OCCHE's work to help bolster health equity and healthcare facility resilience.



WHAT'S NEW WITH ASPR?

Since its creation in 2006, ASPR has been tasked with helping the country prepare for and respond to naturally occurring and human caused disasters and public health emergencies (PHE). Since the last issue of *The Exchange* was published in December 2023, HHS renewed both public health emergency declarations for the state of Hawaii due to wildfires ([renewed on May 2, 2024](#)) and [the opioid crisis](#) (renewed on March 24, 2023). The most current PHE information can be found on ASPR's [Declarations of a Public Health Emergency](#) webpage.

In early January, Assistant Secretary O'Connell shared [a blog on ASPR's work in 2023](#). The Medical Reserve Corps (MRC) Program Director also honored Dr. Martin Luther King, Jr. and [described how MRC units serve communities across the Nation](#). HHS and Pfizer leaders met with healthcare provider groups [to explain the commercialization of COVID-19 therapeutics](#). ASPR released [voluntary cybersecurity performance goals](#) in January to help healthcare sector organizations access information on and implement best practices. At the end of the month, [a press release](#) detailed ASPR's role in developing recommendations to address the behavioral health impact of the train derailment in Palestine, OH. In February, Assistant Secretary O'Connell released a [blog on Mpox](#), describing local and international preparedness work, vaccines, and therapeutics.

In March, Assistant Secretary O'Connell [traveled to Japan and Australia](#) to discuss collective lessons learned during the COVID-19 and Mpox responses and as other topics of mutual concern including health security, emergency medical response, biocontainment, and pandemic preparedness. The Medical Reserve Corps [\(MRC\) provided support to tens of thousands of people](#) marking the anniversary of the 1965 civil rights march across the Edmund Pettis Bridge. ASPR released [a statement on the President's Fiscal Year 2025 Budget](#); this was followed by a [Public Health Emergency Medical Countermeasure Enterprise Multiyear Budget Assessment for FY 2023-2027](#). At the end of the month, the [Biomedical Advanced Research and Development Authority launched the "Patch Forward Prize"](#) which will award a total of \$50 million for innovations in patch-based technology for RNA-based COVID-19 and influenza vaccines.

ASPR released a [Health Equity Fact Sheet](#) in April, with the goal of improving equitable access to and delivery of ASPR services to all members of our communities by making health equity integral to ASPR's organizational readiness and external preparedness, response, and recovery activities. In May, ASPR's Rhode Island MRC and partners [opened a new, cutting-edge training facility for public health emergency officials](#). Earth Day provided a chance to illustrate [how ASPR prepares and responds to the impacts of climate change](#).

Visit the [ASPR homepage](#) and [blog](#) and follow us on [LinkedIn](#), [Facebook](#), [X](#), and [Instagram](#) to learn more about how we are working to keep our communities safe, healthy, and resilient.



Supporting the Community through Historic Flooding: Central Vermont Medical Center's 2023 Experience

SUMMARY

The state of Vermont experienced significant flooding in July 2023, when already soaked soil received 3-5 inches of rain on July 7 followed by up to seven inches of rain in some areas between July 9-11. Anna Tempesta Noonan, President and Chief Operating Officer of the University of Vermont Health Network - Central Vermont Medical Center, met with ASPR TRACIE to share how the facility remained open and continued to serve residents during this historic weather incident.

KEY TAKEAWAYS

- The ability to virtually activate hospital incident command can help ensure an timely and efficient response.
- Community members may lose their medication(s) during a disaster. Standing up temporary pharmaceutical services can help bridge that gap.
- Staffing first aid tents in the community can help provide basic healthcare (and other resources) to residents and volunteers.
- Monitoring traffic websites can improve staff situational awareness of alternative routes when many roads are closed.

RELATED ASPR TRACIE RESOURCES

- [After the Flood: Mold-Specific Resources](#)
- [Healthcare Facility Evacuation/Sheltering](#) Topic Collection
- [Hurricane Resources Page](#)
- [Natural Disasters](#) Topic Collection
 - » [Lessons Learned: Floods and Landslides](#)
 - » [Plans, Tools, and Templates: Floods and Landslides](#)

OTHER RELATED RESOURCES

- [Central Vermont Medical Center Operations 'Significantly Impacted' by Flooding](#)
- [The Great Vermont Flood of 10-11 July 2023: Preliminary Meteorological Summary](#)
- [Vermont Hospitals Grapple with Historic Flooding](#)
- [United States Road Conditions](#)



Hot Spots: Reflecting on the Summer of 2023

SUMMARY

This article provides a snapshot of burns and heat-related illness in the summer of 2023 accompanied by links to related ASPR TRACIE resources that can help readers prepare for extreme heat and wildfires.

KEY TAKEAWAYS

- *Earlier spring melt and variable snowfall leads to less water availability during hot summers, increasing wildfire risk.*
- *Healthcare providers should prepare for an increase in burn injuries incurred from flames or contact with hot surfaces (e.g., pavement) and illnesses associated with poor air quality due to smoke and pollution.*

RELATED ASPR TRACIE RESOURCES

- [Burns Topic Collection](#)
- [Disaster Behavioral Health Resources Page](#)
- [Evacuating and Receiving Patients in the Midst of a Wildfire](#)
- [Experiences from the Field: The Signature Healthcare Brockton Hospital Fire](#)
- [Extreme Heat Events: Lessons from Seattle's Record-Breaking Summers](#)
- [Healthcare Coalition Burn Surge Annex Template](#)
 - » [Step-by-Step Guide to Implementing the Coalition Burn Surge Annex TTX Template \(PDF\)](#)
 - » [Using the ASPR TRACIE Burn Surge Templates to Enhance an HCC \(PPT\)](#)
- [Innovations in Hospital Design-Penn Med Pavilion](#)
- [Innovations in Hospital Design-Mayo Clinic](#)
- [Mass Burn Event Overview](#)
- [Natural Disasters Topic Collection](#)
 - » [Lessons Learned: Extreme Heat](#)
 - » [Lessons Learned: Fire/Wildfire](#)
 - » [Plans, Tools, and Templates: Extreme Heat](#)
 - » [Plans, Tools, and Templates: Fire/Wildfire](#)
- [The Exchange, Issue 10: Preparing for and Responding to Wildfires and Planned Outages](#)
- [The Last Stand: Evacuating a Hospital in the Middle of a Wildfire](#)



Extreme Weather and Healthcare – Are you Ready for a Burn Disaster?

SUMMARY

With the escalation of extreme heat events and wildfires due to climate change, the incidence of burn injuries increases. This article provides an overview of North American burn disaster regions and related organizations and highlights the importance of planning and exercising for burn mass casualty incidents with an emphasis on telehealth and burn triage.

KEY TAKEAWAYS

- *All hospitals are capable of stabilizing a critical burn patient for 72-96 hours.*
- *Non-burn facilities can care for less acute burn patients with support and resources.*
- *Telehealth can facilitate consultation with burn professionals, saving patient transport and burn center resources for the most critical patients.*
- *Collaborating with regional burn centers when planning and exercising is imperative; verified centers have a commitment to outreach education within their coverage areas.*

RELATED ASPR TRACIE RESOURCES

- [Burns](#) Topic Collection
- Disaster Available Supplies in Hospitals (DASH) Tool- [Burn Module](#)
- [Healthcare Coalition Burn Surge Annex Template](#)
 - » [Step-by-Step Guide to Implementing the Coalition Burn Surge Annex TTX Template](#)
- [Mass Burn Event Overview](#)
- [Using the ASPR TRACIE Burn Surge Templates to Enhance an HCC](#) (Speaker Series Recording)

OTHER RELATED RESOURCES

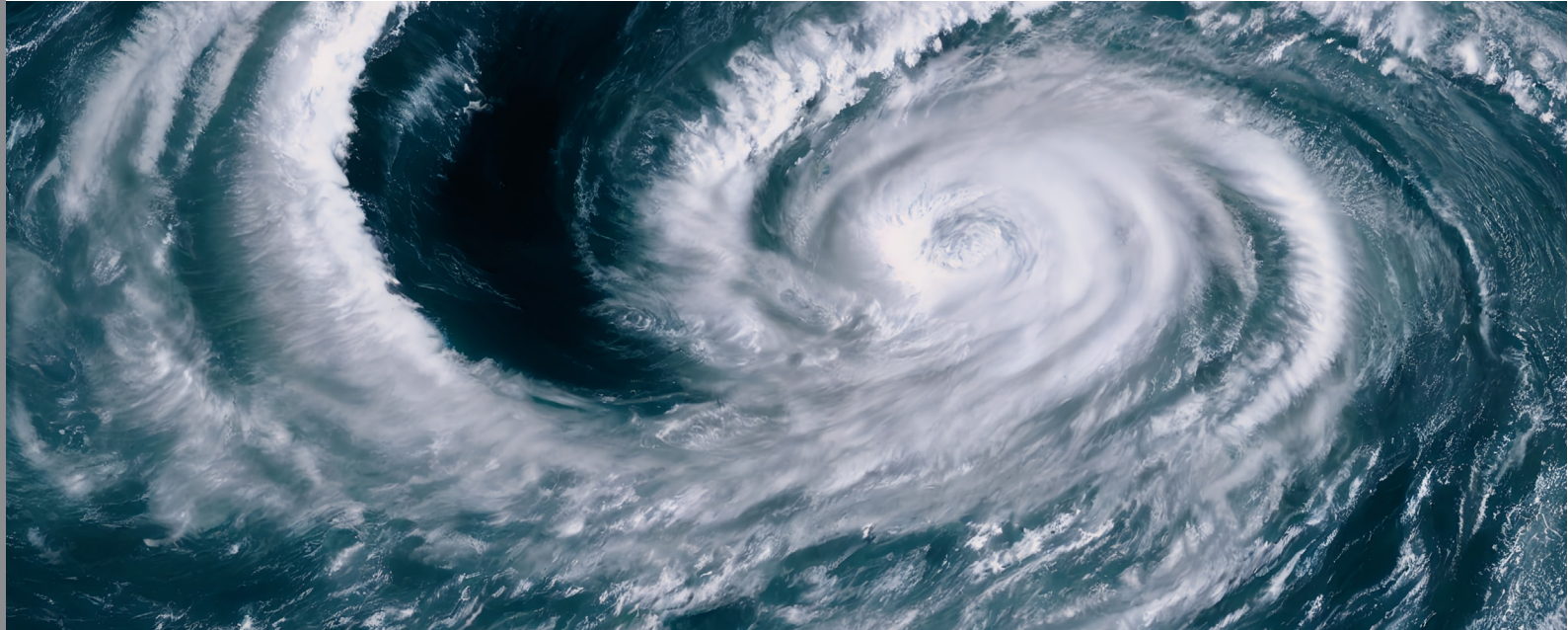
ABA Resources

- [ABA's Disaster Response Page](#)
- [Burn Mass Casualty Incidents, the Revised \(v.3\) Triage Tables during a Surge of Burn Injured Patients](#)
- [Patient Care Priorities for the First 24 Hours in Burn Mass Casualty for Non-Burn Physicians](#)

Western Region Burn Disaster Consortium & Partner Resources

- [Burn Buddy Badge](#)
- [Burn Injury Guidelines for Care](#)
- [Burn Injury Poster](#)
- [Burn Surge Tabletop Exercise Toolkit](#)
- [Burn Surge Planning Toolkit](#)





Climate Resilience and Mitigation: The Federal Perspective

SUMMARY

The [Office of Climate Change and Health Equity](#) (OCCHE) was established in 2021, under the direction of the U.S. Department of Health and Human Services Assistant Secretary for Health. ASPR TRACIE met with Dr. John Balbus (Director of OCCHE and Deputy Assistant Secretary for Climate Change and Health Equity) and Dr. Aparna Bole (Pediatrician, Senior Consultant with OCCHE, and Special Expert, Office of the Director, Agency for Healthcare Research and Quality) to learn more about OCCHE's work to help bolster health equity and healthcare facility resilience.

KEY TAKEAWAYS

- OCCHE focuses on acute (e.g., severe storms, heat waves) and chronic (e.g., drought, loss of water supply) stressors that pertain to people's lives and to healthcare facilities and infrastructure.
- Energy efficiency can increase operating efficiency, reduce operating costs, decrease contributions of healthcare to climate change, and increase resilience to climate related events.
- Mitigation and resilience building must be continuous; many communities will be in response mode more frequently and recovering for a long time

RELATED ASPR TRACIE RESOURCES

- [Climate Change and Health Care System Considerations](#) Topic Collection
- [Climate Change Resilience and Health Care System Considerations](#) (Report)
- [Climate Change Resilience and Health Care System Considerations](#) (Webinar)
- [Disasters and Healthcare Disparity](#) Topic Collection
- [Extreme Heat Events: Lessons from Seattle's Record-Breaking Summers](#)
- [Healthcare Facility Extreme Weather Resilience and Mitigation](#) (Webinar)
- [Hurricane Resources Page](#)
- [Natural Disasters](#) Topic Collection

OTHER RELATED RESOURCES

- [Climate Change and Health Equity Strategy Supplement](#)
- [Climate and Health Outlook](#)
- [emPOWER Program](#)
- [Heat & Health Tracker](#)
- [HeatRisk](#)
- [Sustainable and Climate Resilient Healthcare Facilities Toolkit](#)



RECOMMENDED RESOURCES



Since the last issue of *The Exchange* was published, ASPR TRACIE released the following new resources (listed alphabetically):

- [Crisis Standards of Care: Lessons From the COVID-19 Pandemic](#) (Speaker Series Recording)
- [Determining Hospital Supply Needs and Likely Usage during an Incident](#) (Webinar)
- [Healthcare Facility Extreme Weather Resilience and Mitigation](#) (Webinar)
- [Hospital Mass Casualty Response Plan Considerations](#)
- [Lessons Learned from the Signature Healthcare Brockton Hospital Fire](#) (Webinar)
- [Managing a Pediatric Tripleemic: Lessons Learned from 2022](#)
- [Response to the Bryce Canyon Tour Bus Mass Casualty Incident](#) (Speaker Series Recording)
- [Template - Hospital Crisis Standards of Care Resource Allocation Annex](#)
- [The Evolution of Patient Load Balancing: The Southwest Texas Regional Advisory Council](#)

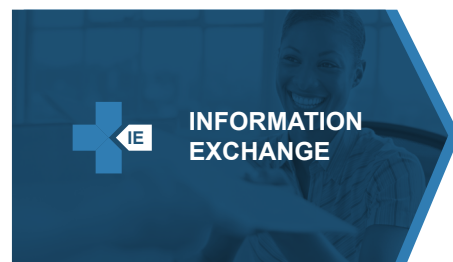
We also updated the following resources:

- [Avian Influenza Quick Facts](#)
- [Crisis Standards of Care Briefs](#)
- [Disaster Behavioral Health: Resources at Your Fingertips](#)
- [Electronic Health Records and Downtime Procedures](#) (Topic Collection)
- [Mass Distribution and Dispensing/ Administration of Medical Countermeasures](#) (Topic Collection)
- [Medical Operations Coordination Centers Toolkit \(Version 3.0\)](#)
- [Solar Eclipses: Planning Resources](#)

We continue to review and refresh our [60 Topic Collections](#); check back often. You can also learn more about rating, commenting on, and saving resources [in this short tutorial](#).



We encourage you to review our recent requests for technical assistance on [Guidance on Taping of Personal Protective Equipment](#), [Patient Decontamination Wash Time Duration](#), and our [summary of responses to select TA requests](#). [Check out this tutorial](#) for assistance navigating the Assistance Center.



Did you know you can create a private group in our [Information Exchange domain](#)? Groups can share files and information in a password protected area in near real-time. [Reach out](#) to learn more!

ASPR TRACIE

Your Healthcare Emergency Preparedness Information Gateway

The Exchange is produced by the Administration for Strategic Preparedness and Response (ASPR) Technical Resources, Assistance Center, and Information Exchange (TRACIE). Through the pages of *The Exchange*, emergency health professionals share firsthand experiences, information, and resources while examining the disaster medicine, healthcare system preparedness, and public health emergency preparedness issues that are important to the field. To receive *The Exchange*, visit <https://asprtracie.hhs.gov/register> and enter your email address.

ASPR TRACIE was created to meet the information and technical assistance needs of ASPR staff, healthcare coalitions, healthcare entities, healthcare providers, emergency managers, public health practitioners, and others working in disaster medicine, healthcare system preparedness, and public health emergency preparedness. The infographic illustrates ASPR TRACIE's reach since launching in September 2015.



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