



Southwest Virginia **HEALTHCARE COALITION**

Southwest Virginia Healthcare Coalition (SVHC) Hurricane Helene After Action Report/Improvement Plan (AAR/IP)

Event Dates:
September 26 – October 10, 2024

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Executive Summary

Hurricane Helene, which struck the Southwest Virginia region in late September 2024, was a catastrophic event that resulted in unprecedented flooding, widespread infrastructure damage, and significant disruption to critical services. Over the course of three days, the storm brought heavy rainfall that overwhelmed local watersheds, causing rivers and streams to rise to historic levels. Key areas, including Grayson County, Washington County, Tazewell County, and Craig County, experienced severe damage to roads, bridges, and power grids, leaving several communities isolated and in need of immediate assistance ([Cardinal News, 2024](#)). The agricultural sector suffered over \$126 million in damages ([Virginia Farm Bureau, 2024](#)), while emergency services executed over 70 high-risk rescues ([Virginia Department of Emergency Management, 2024](#)). Tragically, two fatalities were reported, emphasizing the storm's deadly impact ([Cardinal News, 2024](#)).

This After Action Report/Improvement Plan (AAR/IP) identifies key strengths in the region's emergency preparedness and critical gaps. Lessons learned from this event emphasize the need for enhanced community resilience through investments in infrastructure, expanded training, and improved interagency coordination. These recommendations aim to mitigate future risks and ensure the SVHC region is better prepared for extreme events.

Objectives

- Evaluate the effectiveness of the region's healthcare emergency management systems during Hurricane Helene, including resource allocation and coordination efforts.
- Document successful strategies and gaps in disaster response, focusing on communication, infrastructure, and critical service continuity.
- Provide actionable recommendations to strengthen infrastructure, training, and inter-agency collaboration for improved disaster preparedness.

Outcomes

The resulting AAR/IP is a detailed document that includes an executive summary, key findings, and tailored recommendations aimed at equipping regional partners with practical steps to enhance preparedness and response capabilities. Stakeholders were actively engaged throughout the process, reviewing the draft report, and contributing feedback to refine and enhance its content. This collaborative approach ensured the final report was both insightful and actionable, providing a valuable resource to improve disaster readiness and address the identified gaps in emergency response systems.

AAR/IP Design

The process for developing the AAR/IP to evaluate the response to Hurricane Helene included several key steps to ensure a thorough and actionable evaluation. The project began with consultations to define objectives, identify stakeholders, and establish a timeline, followed by structured data collection. This included gathering qualitative data through stakeholder interviews, distributing surveys to confirm findings, and conducting internal documentation reviews such as incident logs and situation reports. Enclosure 1 is the survey summary.

The AAR/IP includes a detailed report featuring an executive summary, key findings, and tailored recommendations for regional partners. Stakeholders reviewed the draft report, provided

feedback to refine and enhance its content, and finalized the report to ensure it offers practical steps for improving preparedness and response capabilities. This structured process ensured the AAR was a valuable resource for enhancing disaster readiness and addressing identified challenges.

Major Strengths

- **Proactive Resource Management:** SVHC demonstrated effective early activation of its Regional Healthcare Coordination Center (RHCC), ensuring situational awareness and timely response coordination during Hurricane Helene. Additionally, SVHC completed a multi-year water continuity project with backup tanker connections to pressurize critical infrastructure and supplemental water tanks.
- **Innovative Communication Solutions:** The deployment of Starlink systems successfully restored communication in areas with cellular network failures, demonstrating the regional adaptability and integration of advanced technologies.
- **Community-Centered Preparedness:** Many facilities maintained operations through robust emergency management plans, proactive staff training, and innovative solutions such as oxygen bars and autonomous facility operations.

Major Improvements

- **Enhanced Communication Infrastructure:** Expand backup communication systems, such as satellite phones and additional Starlink units, to address gaps caused by cellular network failures.
- **Stronger Interagency Coordination:** Integrating key systems, such as the Virginia Healthcare Alerting and Status System (VHASS), WebEOC, and Veoci, will improve information-sharing and decision-making processes.
- **Supply Chain Resilience:** Identify local caches of essential resources such as oxygen, intravenous (IV) solutions, and water. Promote and support partnerships in establishing direct contracts with local suppliers instead of relying on regional agreements.

Recommended Focal Points for Preparedness

- **Strengthened Communication and Coordination Systems:** Invest in redundant communication systems like satellite phones and Starlink, and integrate platforms, such as WebEOC, Veoci, and VHASS for seamless coordination.
- **Enhanced Resource and Infrastructure Resilience:** Keep inventories of essential resources up to date. Establish and formalize mutual aid agreements to ensure efficient resource sharing.
- **Targeted Exercises:** Conduct region-specific, joint exercises with SVHC, SVHC Regional Stakeholders, Virginia Department of Health (VDH), Virginia Department of Emergency Management (VDEM), and local emergency managers to address unique risks, such as power outages and medical needs, while ensuring medically vulnerable populations are pre-identified.

Overview

Name: Hurricane Helene

Start Date: September 26, 2024

End Date: October 10, 2024

Duration: 15 Days

Event Type: Category 4 Hurricane

Description: Hurricane Helene was a powerful Category 4 hurricane that unleashed devastating winds exceeding 130 mph, torrential rainfall, and widespread flooding across its path. Its immense size and intensity caused severe damage to critical infrastructure, leaving thousands without power and access to essential services for days. The storm's far-reaching impacts tested emergency response systems and highlighted vulnerabilities in regional preparedness and supply chain resilience.

Impacted Areas: See Enclosure 2

Participating Organizations: See Enclosure 3

Background: SVHC is one of four healthcare coalitions within the Virginia Healthcare Emergency Management Program (VHEMP). VHEMP is comprised of the Virginia Department of Health and the Virginia Hospital and Healthcare Association and receives funding from the U.S. Department of Health and Human Services (HHS) Administration for Strategic Preparedness and Response (ASPR) through the Hospital Preparedness Program (HPP).

The SVHC region covers 29 counties and 10 cities, including Lee, Wise, Scott, Washington, Russell, Dickenson, Buchanan, Tazewell, Smyth, Grayson, Carroll, Wythe, Bland, Giles, Pulaski, Montgomery, Floyd, Patrick, Henry, Franklin, Roanoke, Craig, Alleghany, Botetourt, Bedford, Pittsylvania, Campbell, Amherst, Appomattox, and the cities of Norton, Bristol, Galax, Radford, Salem, Roanoke, Covington, Lynchburg, Martinsville, and Danville.

SVHC Chronological Summary of Events

Thursday, September 26, 2024

- SVHC participated in the VDEM Region 4 National Weather Service briefing on Hurricane Helene. Due to the information being shared on that call SVHC created a VHASS Event for regional communication.
- The VHASS event was created, and initial communication challenges were identified during regional weather calls hosted by VDEM Regions 4 and 6.
- Further notifications were sent to the Western Virginia EMS (WVEMS) Council and ESF 8 partners, to include the VDH and the Virginia Hospital Healthcare Association (VHHA).
- SVHC activated the RHCC in response to communication and generator issues at multiple facilities.
- Flooding concerns arose in Richlands, requiring mitigation and rerouted access.

Friday, September 27, 2024

- Continued information exchanges with VDEM Regions 4 and 6, WVEMS Council, and ESF partners resumed.

- Several regional facilities faced operational disruptions and were functioning on generator power.
- The RHCC received situational awareness from the Northeast Tennessee Healthcare Coalition that a hospital in Tennessee was evacuating due to flooding.
- Several regional dialysis centers altered operations and rescheduled patients.
- Communication outages led to the deployment of Starlink systems in collaboration with VDEM Region 4 and 6 Communications Cache team.
- The RHCC staff faced challenges in reaching SVHC staff members, local emergency managers, and healthcare staff due to connectivity issues, highlighting gaps in backup communication systems.

Saturday, September 28, 2024

- Oxygen shortages became a critical issue for patients. The RHCC coordinated with local emergency managers, regional vendors, and neighboring coalitions, including those in Virginia and surrounding states, to secure emergency supplies.
- Long-Term Care Facilities reported ongoing power and communication issues, requiring generator refueling.
- Multiple boil water notices were issued, requiring coordination with local emergency managers and public health officials.
- The RHCC received multiple calls to support the local sheltering operations.
- Daily calls with ESF 8 partners supported the extensive hurricane response efforts across the region. The RHCC quickly prioritized activations into communication support, power failures, and water disruptions categories.

Sunday, September 29, 2024

- The RHCC addressed urgent oxygen needs and supported nearby shelters by staffing various calls from local emergency managers and health emergency coordinators.
- The RHCC supported Skilled Nursing Facilities (SNFs) by assisting with discharges, placements, and resource needs procured through regional vendors.
- Communication and resource coordination improved with WebEOC updates, which led to fulfilling oxygen tank requests.
- Starlink systems were successfully deployed to ensure connectivity.

Monday, September 30, 2024

- Due to ongoing water notices, the RHCC conducted a regional situational report to determine what impacts affected healthcare facilities.
- Continued coordination included resource requests for handwashing stations and potable water, alongside resolving media inquiries and internal facility communications.
- Discussions surrounding the relocation of Starlink systems emphasized flexibility in addressing ongoing connectivity issues.

Key Post-Storm Activities (October 1-10, 2024)

- Coordination meetings with statewide partners focused on healthcare impacts and provided situational awareness from neighboring states.
- SVHC continued monitoring nationwide supply chain shortages, including issues at the Baxter production plant affecting IV solutions.

- The RHCC deployed handwashing stations in response to ongoing water disruptions and extended boil water advisories.
- To support healthcare facilities experiencing intermittent communication outages, the RHCC deployed Starlink systems.
- Despite infrastructure disruptions, VHASS communications ensured connectivity among regional partners.
- Discussions began to debrief and support recovery operations.

Improvement Plan

Lesson Learned	Recommendations	Corrective Action Description	Responsible Individual	Title	Start Date	Completion Date
Integrate Inland Hurricane Impacts into HVAs	Update the regional and local HVAs to include inland hurricane impacts and cascading effects.	Impacts and cascading effects must include flooding, tornadic activity, and prolonged power outages. Ensure alignment with emergency plans.	SVHC and Member Entities	Emergency Managers	March 2025	May 2025
Enhance Communication Redundancy and System Integration	Bolster redundant communication systems.	Include satellite phones, Starlink, and VOIP, with pre-event testing. Integrate regional communication processes.	State Agencies, SVHC, and Member Entities	Key Leaders	March 2025	December 2025
Address Gaps in Critical Infrastructure	Conduct an audit of generator connections, power systems, HVAC, and water utilities.	Ensure critical systems are supported. Prioritize local and regional assessments.	SVHC and Member Entities	Key Leaders and Emergency Managers	May 2025	December 2025
Formalize Agreements with Vendors	Develop contracts or Memorandums of Understanding (MOUs) for emergency services from vendors.	Include oxygen resources, durable medical equipment, fuel, ventilators, and IV solutions. Ensure inclusion of vulnerable and acute care patients.	Member Entities	Key Leaders and Emergency Managers	April 2025	June 2026
Conduct Regional Drills Involving Stakeholders	Expand and improve regional exercises.	Focus on communication protocols, resource allocation, supply chains, patient movement, and volunteer readiness. Incorporate practical, hands-on experiences.	SVHC and Member Entities	Emergency Managers	June 2025	June 2026

Conclusion

The response to Hurricane Helene highlighted the strengths and resilience of the region's emergency management framework while identifying critical areas for improvement. Early activation of the RHCC and the innovative deployment of technologies like Starlink ensured situational awareness and resource coordination despite significant challenges. The dedication and adaptability of facilities, coalition members, and emergency responders were evident in their ability to mitigate the storm's impacts and provide essential services under strained conditions.

SVHC is developing an Ultra High Frequency (UHF) regional radio network, which will be called the Crisis Radio System. The project is currently in its second year of a multi-year plan. Once the infrastructure and framework are completed, all hospitals within the SVHC region will be equipped to communicate through the radio network.

Hurricane Helene exposed vulnerabilities that require immediate attention to enhance future preparedness and response capabilities. Key lessons learned include the need for updated and comprehensive HVA that accounts for emerging risks such as inland hurricanes and cascading effects. Strengthened communication infrastructure, including redundant systems and better integration of platforms like VHASS, WebEOC, and Veoci, will address current gaps in interagency coordination and information sharing. Additionally, supply chain resilience must be bolstered through regional assessments, which determine caches and critical resources, and improved resource allocation protocols.

The recommendations outlined in this AAR/IP provide a clear roadmap for addressing these gaps. Corrective actions, such as developing contracts or MOUs with vendors into emergency plans, expanding regional exercises, and evaluating regional infrastructure for healthcare facilities focusing on critical systems, are essential for building emergency management systems. These efforts must be paired with ongoing training, targeted exercises, and stakeholder collaboration to ensure the region is well-prepared for future disasters.

By implementing these improvements, the region can better protect its most vulnerable populations, enhance operational continuity, and foster resilience in the face of increasingly complex challenges. The commitment of coalition members and community partners will be instrumental in achieving these goals and strengthening preparedness for all.

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Enclosure 1: Survey Summary

Question 1: How effective was the communication and coordination between coalition members, healthcare facilities, and emergency management during Hurricane Helene?

	Very Ineffective	Somewhat Ineffective	Neither Effective nor Ineffective	Somewhat Effective	Very Effective
Communication	5.7%	5.7%	8.6%	17.1%	62.9%
Coordination	5.7%	5.7%	17.1%	11.4%	60%

Question 2: Please provide examples or suggestions for improvement in communication and collaboration.

General Comments on Impact and Coordination:

- Several organizations reported minimal or no impact during Hurricane Helene, especially facilities not in directly affected regions.
- Many praised the SVHC and RHCC for proactive communication and coordination through established platforms like VHASS, daily calls, and direct follow-ups.
- Communication silos caused delays between various entities (i.e., local, regional, and state), hindering the effectiveness of centralized coordination.

Communication and Infrastructure Challenges:

- Communication breakdowns, including internet and phone service disruptions, created challenges in resource sharing and situational awareness. Many facilities relied on cell phones and email as alternative communication methods, but some noted the need for backup systems like Starlink, VOIP, and regional radio networks.
- The recent merger of healthcare coalitions led to inconsistent communication practices, with some facilities defaulting to older, less centralized methods.

Emergency Operations and Resource Management:

- Many facilities highlighted the effectiveness of pre-event planning and teamwork during the response.
- Some facilities struggled with coordination regarding resource requests (e.g., oxygen needs) and shelter information.
- Concerns were raised about delays in setting up a Disaster Recovery Center (DRC) due to task-saturated localities.

Technology and Preparedness Improvements:

- The deployment of Starlink was praised but revealed inefficiencies in unknown or underdeveloped standard operating procedures.
- The multi-year regional radio project was noted as a critical step toward addressing gaps in communication redundancy.

Staff and Participant Feedback:

- Limited staffing in many facilities made it difficult to participate in off-site meetings, highlighting the value of virtual platforms for coordination.
- Facilities noted that internal communication and teamwork were strong, but external information flow was slower.

Question 3: Were the necessary resources (e.g., medical supplies, staffing, transportation) available and effectively allocated to meet the coalition's needs during Hurricane Helene?

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Supplies	2.9%	8.6%	34.3%	31.4%	22.9%
Staffing	2.9%	2.9%	48.6%	20%	25.7%
Transportation	2.9%	0%	54.3%	20%	22.9%

Question 4: Please provide examples or suggestions for improvement for resources.

General Feedback on Resource Availability:

- Many respondents reported no significant resource needs or disruptions, particularly in areas less directly impacted by the hurricane.
- Some facilities highlighted that resource management and supply chain continuity were sufficient, with no major shortages identified.

Oxygen and DME:

- A recurring concern was access to oxygen and medical supplies for medically vulnerable, homebound residents, especially over weekends. Businesses were not fully responsive during after-hours.
- Suggestions included creating a ready list of suppliers with weekend service availability and developing a voluntary registry of medically vulnerable residents to expedite resource allocation. The State of Florida's model was highlighted as a best practice.
- Respondents suggested involving DME companies in local emergency preparedness committees to improve coordination during events.
- Establishing an emergency contact list for DME providers to address after-hours needs was recommended.

Vendor and Resource List Updates:

- Many requested updated vendor lists and workflows for resource requests when regional supplies are insufficient.
- Developing a shared regional resource guide and distribution plan to improve awareness of available resources and state partner capabilities was emphasized.

Staffing and Coalition Support:

- Staffing shortages at SVHC due to personnel transitions were noted but mitigated by cohesive teamwork and support from WVEMS and other partners.
- SVHC was commended for maintaining operations under limited staffing conditions, but this highlighted the need for further development of continuity of operations within the Virginia Healthcare Emergency Management Program (VHEMP).

Resource Deployment Plans:

- Suggestions were made to further develop the deployment plan for Starlink assets, ensuring clarity on roles and initiation processes for public safety organizations involved.

Communication and Awareness:

- Better communication and awareness of state partner capabilities and resource distribution plans were requested.
- Coordination between healthcare coalitions, local health districts, and state agencies needs clarification to streamline roles and responsibilities.

Water Supply:

- SVHC completed a multi-year water continuity project in July 2024, equipping hospitals in the region's western portion with backup tanker connections and pumps to pressurize critical infrastructure and supplement water tanks. Regional assessments guided the project, enhancing facility resiliency during water disruptions.
- Concerns about water contamination and emergency water supplies were highlighted. Some facilities successfully utilized emergency water reserves and provided drinking water to patients.

Planning for Medically Compromised Populations:

- Improved advanced planning for medically compromised populations, particularly those reliant on electrical devices and IT connectivity, was recommended.

Positive Feedback:

- SVHC received praise for going above and beyond in providing assistance and resources during the response.
- Internal coordination and teamwork were noted as key strengths, with some facilities reporting seamless operations and minimal disruptions.

Recommendations for Future Preparedness:

- Expanding communication networks and updating resource deployment strategies were suggested.
- Focus on proactive planning for specific vulnerable populations and fostering stronger partnerships with regional stakeholders.

Question 5: What specific aspects of emergency preparedness and response plans worked well? Which aspects need revisions? Please consider your agency/organization plans and the coalition plans. Be sure to highlight which plan you are describing in your remarks.

Strengths

Proactive Monitoring and Preparedness:

- Agencies monitored the hurricane's potential impacts, including flooding, wind damage, transportation, and power.
- Backup generators were evaluated and functional, ensuring operational readiness.

Regional Coordination and Resource Management:

- Regional coordination, especially involving the coalition, was effective. Stakeholders contacted SVHC for incident support.
- VDH collaborated effectively across multiple districts to manage water advisories, provide vaccines, and offer well and septic testing.

Communication Systems:

- Communication processes before, during, and after the response were timely and adhered to established operations plans (e.g., MRC plans).
- Emergency alerts and collaboration between Emergency Medical Services (EMS) and emergency departments provided real-time updates on road conditions and hazards.

Teamwork and Resource Sharing:

- Pallets of water were distributed to staff and patients during the boil water ban, ensuring adequate supplies.
- Collaboration between healthcare and non-healthcare entities facilitated resource-sharing and coordinated responses.

Facility Operations:

- Facilities accommodated people needing shelter, demonstrating adaptability.
- Centralized communications and teamwork within facilities ensured operational continuity.

Pre-Event Reviews and Exercises:

- Some organizations conducted plan reviews and exercises, ensuring preparedness for flooding and other potential risks.

Areas for Improvement:

Home Oxygen and Vulnerable Populations:

- Gaps in addressing the needs of home oxygen-dependent populations led to emergency room congestion. Coordination with DMEs was inconsistent.
- Lack of shelters equipped for oxygen-dependent individuals created additional challenges.

Plan Utilization and Awareness:

- While coalition plans were available, some facilities did not utilize them, highlighting a gap in awareness or training.
- Staff were often unsure of their own plans or failed to reference previously shared protocols.

Generator and Backup Systems:

- Misunderstandings about which appliances were connected to generators led to operational disruptions (e.g., laundry services).
- Facilities need to ensure all critical appliances and systems are connected to backup power.
- Audit generator connections to confirm all critical systems are supported, including appliances like washers and dryers.
- Develop contingency plans for extending power supply beyond standard durations.

Centralized Communication and Coordination:

- Lack of a unified communication plan incorporating all regional response agencies led to difficulties in interagency collaboration.
- Agency-to-agency communication was perceived as cumbersome compared to person-to-person interactions.

Community and Shelter Planning:

- Some organizations lacked mustering points or clear plans for relocating to alternate locations during emergencies.
- More planning for community shelters and collaboration with local utilities is necessary to address vulnerabilities.
- Agencies should collaborate to clearly define roles and responsibilities for ensuring shelters are equipped with essential emergency supplies.

Question 6: Did previous training, drills, or exercises adequately prepare the coalition and its members for the challenges of Hurricane Helene?

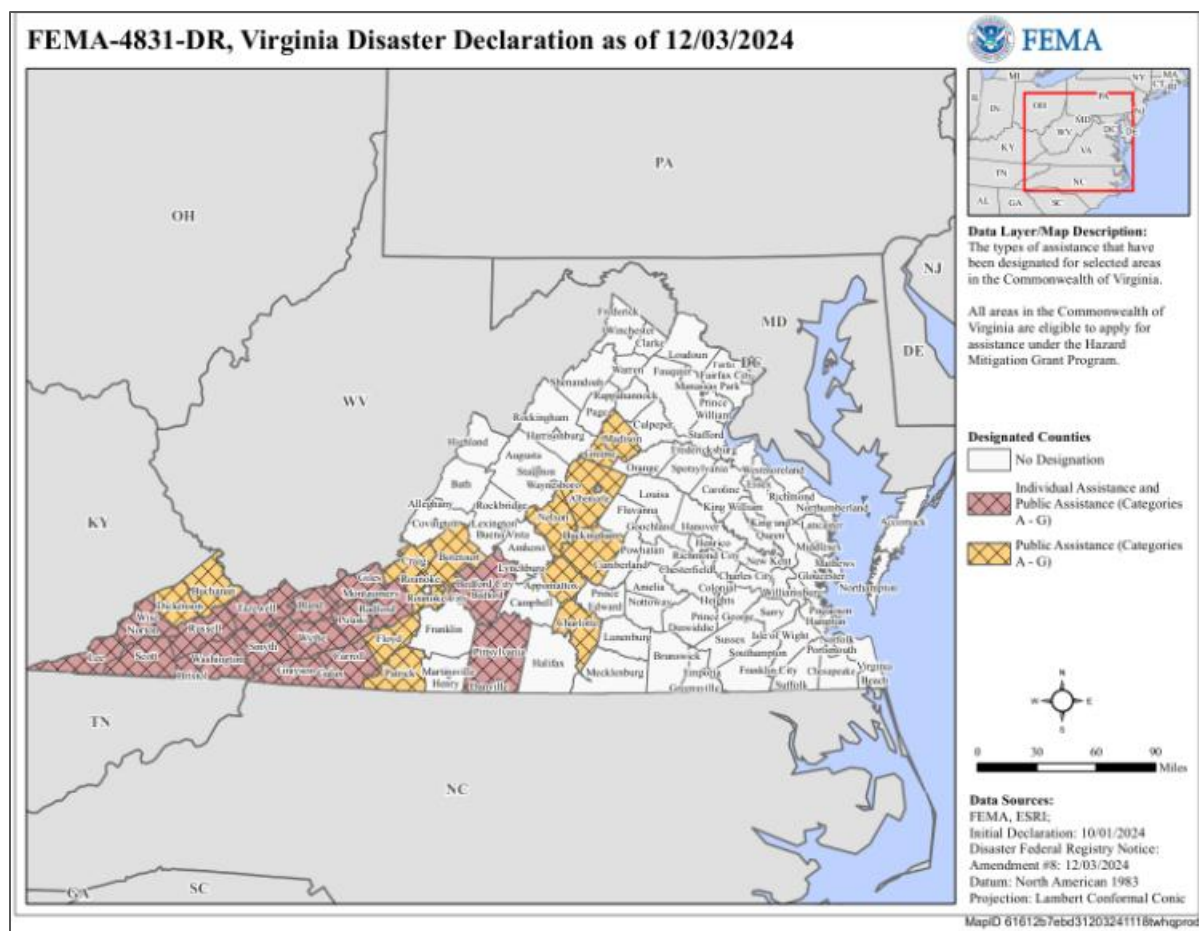
	No	Somewhat	Yes
Training	2.9%	28.6%	68.6%
Drills	2.9%	34.3%	62.9%
Exercises	5.7%	34.3%	60%

Question 7: What additional training or exercises would have been beneficial?

- Many respondents indicated no additional training needs at this time or provided non-applicable (N/A) answers.
- Training on communications during surge situations, specifically focusing on mass care and shelter operations, would assist during medical surges.

- Meeting with FEMA representatives to better understand their disaster response processes, particularly the coordination with hospitals and emergency managers.
- Backup communication deployment training, including practical, hands-on exercises rather than tabletop drills.
- Mass casualty training, HICS classes on ICS structure and functionality, and exercises addressing long-term utility disruptions, such as extensive water outages.
- Training on alternative communication strategies and education on Starlink capabilities and deployment was also noted.
- Concerns were raised about the perceived ineffectiveness of certain drills and exercises, with a suggestion that they have become overly formalized rather than opportunities to revise plans or improve operational synergy.
- Some respondents called for better state-level support during disasters and training tailored to acquiring and managing resources, such as oxygen or IV solutions.

Enclosure 2: Impacted Areas



Enclosure 3: Participating Organizations

Abingdon Health and Rehab Center	Southwest Virginia Healthcare Coalition (SVHC)
Blue Ridge Medical Center	Springtree Health and Rehab Center
Buchanan General Hospital	Southwestern (SW) Virginia Mental Health Institute
Carilion New River Valley Medical Center	SW Virginia Deputy Regional Epidemiologist
Carilion Tazewell Hospital	SWVA EMS Council
Clinch Valley Medical Center	The Rehab Center at Bristol
Deer Meadows	Tri-Area Community Health Clinic
Dickeson Community Hospital	Twin County Regional Hospital
Fresenius Abingdon	Valley Health and Rehab Center
Fresenius Montgomery	Virginia Department of Health (VDH)
Fresenius Twin County	VDH Cumberland Plateau Health District
Fresenius Medical Alleghany	VDH Office of Emergency Preparedness
Galax Health and Rehab Center	Veterans Affairs (VA)
Grayson Health and Rehab Center	Virginia Department of Emergency Management (VDEM)
Heritage Hall Blacksburg	Virginia Hospital and Healthcare Association (VHHA)
Heritage Hall Grundy	Waddell Nursing and Rehab
Heritage Hall Laurel Meadows	Western Virginia EMS Council (WVEMS)
Heritage Hall Tazewell	Westwood Center
Heritage Hall Wise	WVU Medicine
Hillsville Health and Rehab Center	Wythe County Community Hospital
Johnston Memorial Hospital	
Kroontje Center at Warm Hearth	
Lee County Community Hospital	
Lee Health and Rehab Center	
Lonesome Pine Hospital	
Maple Grove	
Medical Reserve Corps	
Montgomery Regional Hospital	
Mount Rodgers Health District	
Mountain Empire Pace	
Mountain Laurel Nursing and Rehab	
NHC Bristol	
Norton Community Hospital	
Nova Health and Rehab Center	
New River Valley Community Services	
Ridgecrest Manor Nursing and Rehab	
Russell County Community Hospital	
Smyth County Community Hospital	