Evaluating the Impact of Large-Scale MCI Training on Disaster Response: Insights from Vista Forge and Hurricane Helene in Western North Carolina

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Abstract

This study examines the impact of large-scale Mass Casualty Incident (MCI) training on real-world disaster response by surveying emergency agencies involved in both the Vista Forge simulation and the response to Hurricane Helene in Western North Carolina. Respondents reported improvements in preparedness, communication, and inter-agency coordination, attributing these to protocols and roles rehearsed during Vista Forge. These findings support the value of region-specific, multi-agency MCI exercises in enhancing disaster readiness and operational efficiency.

Methods

We conducted a qualitative survey of emergency personnel who participated in both the Vista Forge MCI simulation and the real-world response to Hurricane Helene. 100 Vista Forge participants were contacted. 21 respondents answered the survey. (21%) Participants provided open-ended -ended responses comparing preparedness and operational challenges across six key areas: personnel familiarity, inter-agency coordination, medical readiness, resource tracking, volunteer management, and communications - infrastructure. Responses were thematically analyzed to identify patterns in training effectiveness and gaps in real-world performance.
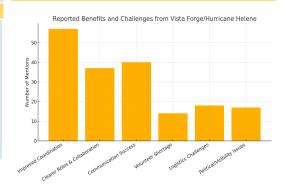
Background & Introduction

Mass casualty incidents (MCIs) place significant strain on emergency response systems. Training exercises like Vista Forge aim to simulate large-scale disasters, enabling agencies to rehearse protocols, improve inter-agency coordination, and identify operational weaknesses. In 2018, responders who participated in Vista Forge were later deployed during Hurricane Helene in Western North Carolina, offering a unique opportunity to assess the real-world impact of such training on disaster response effectiveness.

Limitations

- The data comes from qualitative responses from a small sample size (21 data comes from qualitative responses of a small sample size (21 participants), not a large randomized sample.
- Statistical significance generally requires larger datasets to detect meaningful patterns with confidence.
- Good for insight, not for inference.
- These are survey-style open responses, not numeric measurements or proportions.
- No "control" group of responders who didn't participate in Vista Forge to compare against those who did.
- No pre-exercise vs. post-response performance metrics exist.

RESULTS

Preparedness Area	Vista Forge Contribution	Real-World Effect in Helene
Personnel Familiarity	Rehearsed roles and scenarios	Faster adaptation and execution
Inter-agency Coordination	Built connections among local, state, and federal actors	Strong collaboration, some gaps remained
Medical Readiness	Practiced mobile hospital, EMS deployment	Effective triage and field care
Resource Tracking	Light testing in exercise	Tracking issues with deployed assets
Volunteer Management	Recognized need but under-addressed	Still a barrier; volunteer shortages reported
Communications & Infrastructure	Systems tested under expected load	Overloaded communication systems

Barriers In Helene Response	Count	Description
Political Influence	1	Federal resources deployed based on optics, not operational need
Site Awareness	1	State EOC unaware of existing medical resources like the MED-1 site
Access to Care	1	Patients had difficulty reaching alternate care locations
Communications	1	Overloaded systems, including statewide radio infrastructure
Staffing/Volunteer Shortage	1	Not enough trained staff to support multiple large-scale operations

Reported Benefits and Challenges from Vista Forge/Hurricane Helene

Discussion & Conclusion

Impact of Vista Forge on Hurricane Helene Response
- Enhanced clarity of roles and agency collaboration
- Better preparedness for mobile hospital and EMS operations
- Boosted responder confidence and inter-agency coordination
- Gaps remained in stress-testing logistics and managing spontaneous volunteers

Role of Diversity & Agency Collaboration
- Respondents represented a broad range of functions: logistics, planning, EMS, liaison, and public health
- Agencies spanned federal, state, local, healthcare, and non-profit sectors
- Vista Forge was credited with laying the groundwork for efficient multi-agency coordination during Helene

Challenges and Operational Barriers
Although infrequent, reported challenges exposed systemic vulnerabilities:

- Communication system overload
- Inadequate number of trained volunteers for critical roles
- Resource tracking issues and logistical confusion
- Limited visibility of key medical sites by the state EOC
- Deployment strategies influenced by political decisions

These challenges, though mentioned individually, collectively reflect areas for systemic improvement.

Conclusions
- Vista Forge contributed positively to tactical readiness and inter-agency functionality
- Persistent systemic issues in logistics, communication, and coordination were revealed during Helene
- Future exercises should integrate more complex, realistic disaster scenarios
- Improved volunteer training and logistics stress-testing are needed to strengthen real-world resilience