Matheson E, Silver J. Innovation and Partnerships in the Face of Disaster: Public Health Response after Hurricane Helene. *North Carolina Medical Journal*. 2025;86(1). doi:10.18043/001c.137487

POLICY FORUM: INVITED COMMENTARIES & SIDEBARS

Innovation and Partnerships in the Face of Disaster: Public Health Response after Hurricane Helene

Ellis Matheson, DNP, RN[1], Jessica Silver, REHS[1]

[1] Buncombe County Health and Human Services

Keywords: Ellis Matheson, Jessica Silver, hurricane helene, public health, environmental health, water quality, disaster recovery, community impact, water infrastructure, health and human services

https://doi.org/10.18043/001c.137487

North Carolina Medical Journal

Vol. 86, Issue 1, 2025

In the wake of Hurricane Helene, Western North Carolina faced significant challenges, particularly with access to water and sanitation. Community collaboration, innovative emergency plans, and quick responses from public health officials were crucial to restoring essential services, supporting local businesses, and ensuring the well-being of residents during the crisis.

Introduction

In the wake of Hurricane Helene's devastating impact on Western North Carolina, our community faced unprecedented challenges that tested the very foundations of daily life. As the storm wreaked havoc during the leaf season, it exposed critical vulnerabilities in our infrastructure and essential services, leaving thousands struggling to access fundamental resources such as water and sanitation. While the local public water supply faced significant disruptions, innovative solutions emerged through collaboration, adaptability, and community spirit. This commentary examines the multifaceted response to the disaster, highlighting the crucial roles of public health officials, local businesses, and community organizations in navigating the aftermath and restoring normalcy amidst the chaos.

Hurricane Helene's Impact on Water Infrastructure

Just by turning on a faucet or attempting to flush a toilet, Hurricane Helene's negative impact on water infrastructure could be felt by every homeowner, business, or entity served by the public water system supply. In the wake of its path, water distribution lines were destroyed, and water supply reservoirs were damaged, rendering them unable to treat and provide water to approximately 60,000 connections. Many of us were without water for flushing for up to 3 weeks after the storm. The people at the public water system worked feverishly to restore damaged distribution lines and issued boil-water notices and advisories to bring the system back into full operation on November 18, 2024.

How do restaurants, hospitals, nursing homes, child care centers, and other facilities operate without water or while under a boil-water notice? How can Public Health rise to this challenge? Environmental Health superheroes were to the rescue.

Action Responses from Buncombe County and NC Health & Human Services

North Carolina establishments regulated by Environmental Health may operate without water and/or while under a boil water notice if they have a pre-approved emergency operations plan (EOP).[1] Plans typically undergo months of review and revision before receiving final approval from the North Carolina Department of Health and Human Services Environmental Health (NCDHHS Environmental Health) Section. In a post-disaster situation, time was not a luxury our community and economy could afford. Out of 1500 food service establishments in Buncombe County, only 144 had pre-approval to operate without water or during a boil-water notice.

With so few establishments able to operate legally, our Buncombe County Public Health–Environmental Health Supervisors sprang into action and proposed a streamlined approach to the NCDHHS Environmental Health Section. The altered version of the EOP process focused on facilities identifying the water source they intended to use and how it would be stored, transported, and maintained while in use. The altered EOP also accounted for activities such as dishwashing and handwashing. Without the ingenuity of Buncombe County's Public Health–Environmental Health Division Food & Lodging Supervisors and the quick response from the NCDHHS Environmental Health Section, the remaining 90% of establishments would not have been allowed to operate, resulting in a tremendous gap in our community's accessing food; this would have had catastrophic impacts on our already fragile post-Helene economy.

Not only were businesses and essential services devastated, but individuals in their homes also struggled to access necessities, such as power and water—if they still had a home. Many people needed temporary shelter; after experiencing trauma from the storm, they faced daily challenges due to unmet needs. This situation can lead to health and medical issues, further complicating people's ability to return to work, support their families, and contribute to the economy.

Innovation and communication played a crucial role in ensuring the health and safety of the community in their personal lives. Flush brigades were formed, with volunteers organized by the Register of Deeds to assist residents unable to pour non-potable water into toilets, thereby helping to alleviate unsanitary conditions. Our communications team worked tirelessly to hold county briefings twice daily with local officials, informing the community about where they could access vital resources.

Community Care Stations were also established within the first few days. The stations, organized by the Buncombe County Emergency Operations Center—with staffing and input from Buncombe County Public Health—became hubs where residents could find necessities, including potable and non-potable water. The hubs also provided access to food, baby items, laundry services, physical and mental health services, and vaccines, such as tetanus, to further help prevent disease.

The Vital Role of Partnerships and Collaboration

Collaboration with partners is essential for achieving equitable and positive health outcomes in public health. This disaster has emphasized this necessity. As we addressed ongoing challenges such as water shortages, flooding, and debris, we collaborated with state and federal partners to ensure that community members had access to essential necessities, including food, potable water for drinking, and non-potable water for other basic needs, such as toilet flushing. We regularly maintain contact and partner with federal and state agencies during normal operations, which is vital for forming relationships before critical needs arise.

In large-scale disasters, entire infrastructures can be destroyed, making it challenging to navigate the overwhelming chaos and myriad community needs. During these times, partnerships that may not seem obvious can become crucial. Public health encompasses many areas of life, and no one can be an expert in every aspect of it. One community we worked with was severely affected, raising concerns about exposure to hazardous chemicals in the mud and debris left by the floodwaters. Therefore, we were fortunate to have new collaborators who reached out to assist us. An academic partner with experience in addressing environmental issues and communication after hurricanes and flooding offered their expertise. While our situation was unique due to the mud and landslides, they provided valuable guidance so that we could adapt to our community's specific needs.

Additionally, we established connections with another academic partner specializing in lead and anti-corrosion materials used in public water supply systems. Human and operational resources are often limited during disasters, making external support critical. This partner created instructional videos for the public and offered to conduct on-site water testing to help ensure community safety.

Conclusion

Innovation and partnership bring hope during times of disaster. In the aftermath of Helene's relentless journey through Western North Carolina, the community stands at a crossroads. The challenges posed by the storm have illuminated not only our vulnerabilities, but also our resilience and capacity for recovery. As we assess the damage and begin the long process of rebuilding, we have an opportunity to strengthen our systems and foster

collaboration among public health, communications, essential services, and the community. By learning from this experience, we can emerge more prepared and united, ensuring that we are better equipped to face future adversities while nurturing the shared spirit of hope and determination that defines our community.

Disclosure of interests

The authors declare no conflicts of interest.

Published: April 30, 2025 EST.

REFERENCES

1. Division of Public Health – Environmental Health Section. *North Carolina Food Code Manual: 5-101.11 Approved System*. NC Department of Health and Human Services; 2021:156. https://ehs.dph.ncdhhs.gov/faf/docs/foodprot/NC-FoodCodeManual-2021-FINAL.pdf