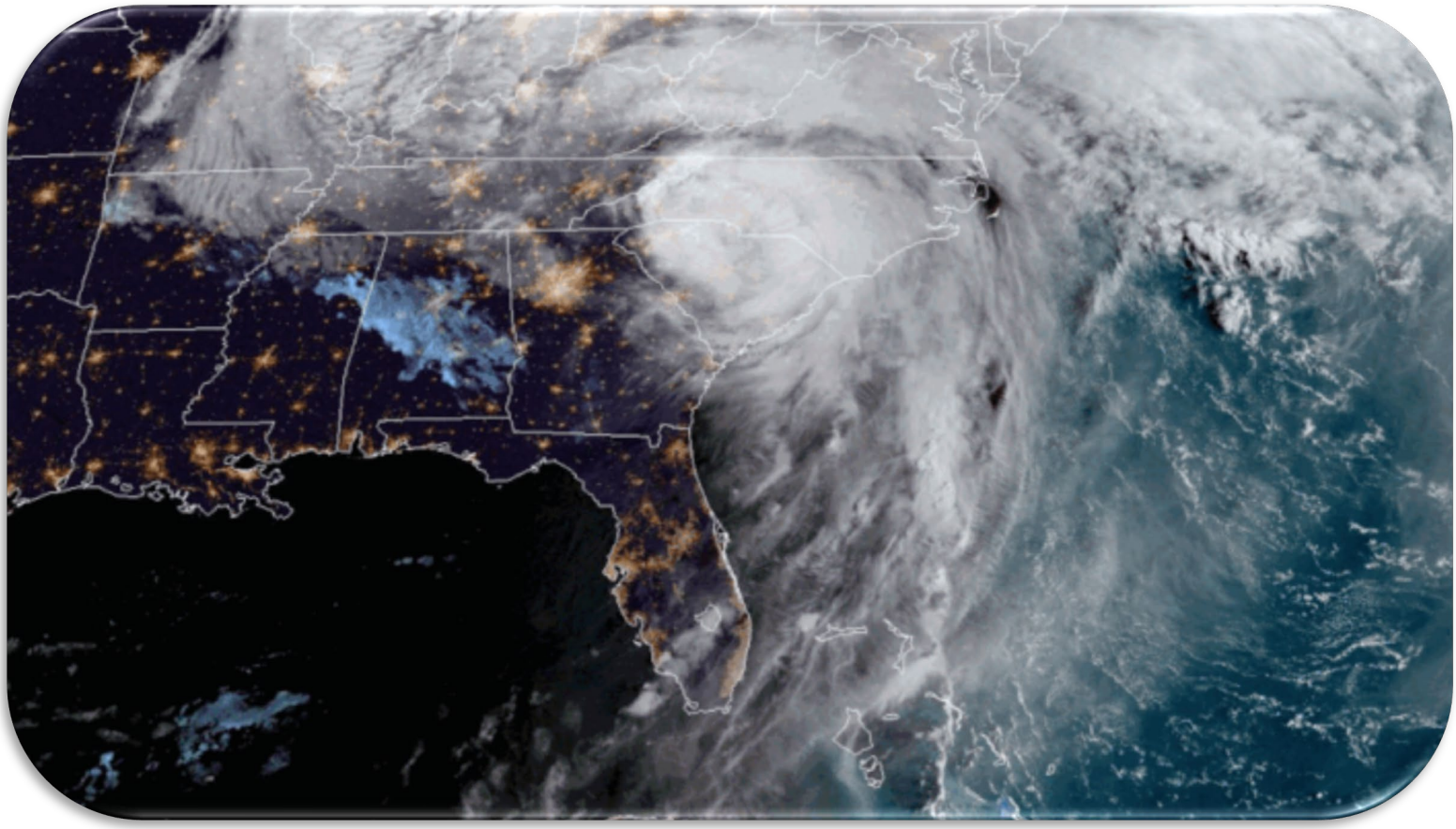

Tropical System Helene After-Action Review

Final Report

North Carolina Division of Public Health

NOT FOR DISTRIBUTION This After-Action Review (AAR) was prepared on behalf of the North Carolina Division of Public Health by a contracted evaluator, in collaboration with key state and local partners. It reflects direct stakeholder input and lived experiences from the public health response to an extraordinary event in our state. The purpose of this document is to support future planning, coordination, and system improvement by capturing lessons learned and identifying actionable insights.

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES
Division of Public Health

UNC GILLINGS SCHOOL OF GLOBAL PUBLIC HEALTH
North Carolina Institute for Public Health

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Administrator's Acknowledgement

On behalf of the North Carolina Division of Public Health, I extend my sincere appreciation to the dedicated public health professionals, healthcare providers, emergency management partners, and community organizations who worked tirelessly to protect the health and safety of our residents during and after Hurricane Helene in September 2024.

Hurricane Helene posed complex public health challenges – from medical sheltering and disease surveillance to environmental health hazards, water safety, continuity of care for vulnerable populations and others. Our public health workforce responded with exceptional professionalism, coordination, and compassion.

I want to express my gratitude to all the public health, emergency management, medical examiner, and community partners who contributed to this After-Action Review (AAR). The response to Tropical System Helene challenged every part of our public health system, from logistics and planning to data sharing and communications. It was a response defined by complexity, coordination under pressure, and deep compassion for the communities we serve.

This review aims to learn from what worked, from what didn't, and where there are opportunities to enhance our readiness for future events. The findings reflect the voices of those who lived this response: those who coordinated supplies, those who worked through grief and uncertainty, and those who served their communities through long hours and difficult decisions. Their insights form the foundation of this report and will guide improvements ahead.

We acknowledge the gaps identified in this report with humility and with purpose. Many of the challenges we faced during Helene were not new, but Helene showed us where we must build, strengthen, and reform as we continue to learn from each incident with a commitment to continuous improvement. This document is not the end of that effort. It is a step in an ongoing process to build a public health response system that is timely, compassionate, and ready for whatever lies ahead.

I extend my sincere thanks to all who contributed to this AAR, and to all those who continue the work of preparedness and recovery every day. We look forward to working across agencies and communities to implement the recommendations in this report and to honor the lessons of Helene with meaningful action.

Kelly Kimple, MD, MPH
Director, Division of Public Health
Chief Medical Officer for Public Health
North Carolina Department of Health and Human Services

Administrative Handling Instructions

This After-Action Review (AAR) was prepared on behalf of the North Carolina Division of Public Health by a contracted evaluator in coordination with key state and local partners involved in the response to Tropical System Helene. The document is intended to support continuous improvement by identifying strengths, challenges, and recommendations related to public health operations throughout the incident.

Distribution Statement

This document is intended for internal use by North Carolina public health, emergency management, medical examiner, and public safety agencies. It may be shared with federal partners and local jurisdictions for preparedness and planning purposes. Redistribution outside of authorized agencies requires permission from the North Carolina Division of Public Health.

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Document Marking

This AAR is an internal planning and improvement document. It is not intended for public release or media distribution. Quotes and findings are anonymized to protect individual confidentiality. This document does not assign fault or liability.

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I. Executive Summary

Tropical System Helene (Helene) impacted North Carolina in late September 2024 and was one of the most destructive storms in North Carolina's history with unprecedented rainfall and intensity impacting the western region of North Carolina where events of this magnitude are rarely experienced. Impacted areas experienced widespread flooding, power outages, and communications blackouts that overwhelmed infrastructure and led to a total of 107 deaths with damages in North Carolina estimated at over $59.6 billion.

The impacts of Helene resulted in immense pressure on the emergency management and public health systems throughout the preparedness and response phases of Helene, with dedicated staff working diligently throughout these phases to respond to the critical needs of those impacted by Helene. The Public Health Preparedness and Response Branch of the Division of Public Health within the North Carolina Department of Health and Human Services led public health operations within the State Emergency Operations Center to coordinate with North Carolina Emergency Management.

The North Carolina Division of Public Health commissioned an independent third-party, to conduct an after-action review (AAR) focused on how the agency collaborated with state and local public health, medical, and emergency management systems to support the Helene emergency response operations in the western region of the state. The North Carolina Institute for Public Health based out of the UNC Gillings School of Global Public Health conducted the AAR from February to May 2025.

The review identified both strengths and challenges in the public health response to Helene, highlighting successful practices but also significant operational and structural weaknesses exacerbated by the unprecedented impacts of Helene. Notable successes, some of which arose due to these challenges, include:

- Public health personnel support from across North Carolina, specifically public health nurses and environmental health specialists from local health departments across the state
- Creative solutions and problem solving to establish and maintain communication despite infrastructure challenges
- Engagement of informal networks and communication channels to address immediate needs of local agencies

There were numerous challenges identified through this review, many of which require immediate attention to improve the public health response to future events:

- The public health response was inflexible and slow to adapt early in the response, leading to delayed decision-making and lack of role clarity during the response

- The public health response involved branches and staff that lack experience in emergency response, which led to inconsistencies, delays and inefficiencies
- Delays in decision-making and inconsistencies led to operating outside standard operating guidance and established chains of command

The findings highlighted in this review are the outcomes of an unprecedented event that had cascading impacts across the public health response. Certain challenges, such as inexperienced staff, are indicative of systemic public health workforce issues with recruitment and retention of staff. Others speak to the need to reinforce the "emergency response mindset" to act with urgency, clarity in roles and responsibilities, and decision-making processes within the chain of command.

The recommendations provided throughout this review present an opportunity for strengthening public health preparedness and response in North Carolina and enhancing partnerships with North Carolina Emergency Management to improve coordination and operations. These recommendations serve as a starting point for improvements across NCDPH, with additional work needed to implement them into agency changes. The net result of these changes will be a more resilient, robust, and coordinated public health response to future public health emergencies and natural disasters.

II. Overview

A. Tropical System Helene Impact

Tropical System Helene (Helene), one of the deadliest and most destructive storms in North Carolina's history, struck the state on September 27, 2024. After making landfall in Florida's Big Bend region as a Category 2 hurricane, Helene moved northeast through Georgia and into western North Carolina as a tropical storm. The storm brought unprecedented rainfall, with some areas recording over 30 inches, leading to catastrophic flooding and landslides across the Appalachian and Piedmont regions.

The impact was pernicious: at least 107 people lost their lives in North Carolina, making Helene the deadliest storm in the state's modern history. The flooding destroyed infrastructure, including over 6,000 miles of roads, more than 1,000 bridges and culverts, and damaged approximately 126,000 homes. Communities like Asheville, Chimney Rock, and Bat Cave were particularly hard-hit, with entire neighborhoods submerged or swept away.

The economic toll was staggering, with damages in North Carolina estimated at over $59.6 billion, surpassing the costs of any previous natural disaster in the state. Recovery has been slow, and many communities continue to struggle with rebuilding and restoring essential services.

B. Tropical System Helene Timeline

Date	Timeline of Events
September 25, 2024	Governor declares a State of Emergency for North Carolina in anticipation of Helene's impacts in North Carolina.
September 26	SEOC activated to "Monitoring" status. National Guard units and response teams begin pre-positioning.
September 27–29	Helene makes landfall on the coast of Florida and begins inland track. Record-breaking rainfall, flash flooding, tornado threats, and strong winds batter the state. County EOCs activate; evacuation orders issued. Power and communications systems fail in multiple regions. SEOC escalates to "Full Activation" (Red) to support statewide response. A Federal Major Disaster Declaration is granted and a Public Health Emergency is declared by US Department of Health and Human Services
September 30	Widespread catastrophic flooding hits Western North Carolina. Road closures and landslides isolate communities.
October 1–2	Search and rescue operations intensify. NCEM deploys additional National Guard units and Swift Water Rescue Teams.

October 4	As water recedes, SEOC transitions back to "Monitoring" (Yellow). Initial damage assessments begin.
October 5 and beyond	Recovery operations continue.

C. Goals of After-Action Review

The North Carolina Division of Public Health (NCDPH) is a state agency within the North Carolina Department of Health and Human Services (NCDHHS) that works to improve the health of North Carolinians. It focuses on disease prevention, health services, and health promotion programs. This includes protecting communities from communicable diseases, epidemics, and contaminated food and water, as well as addressing issues like chronic disease and injury prevention. NCDPH's divisions and programs accomplish this by collaborating with various stakeholders, including local health departments, healthcare providers, community organizations, and other state and federal agencies. NCDPH also plays a crucial role in emergency preparedness and response through its Public Health Preparedness and Response (PHP&R) program.

NCDPH commissioned the North Carolina Institute for Public Health (NCIPH) at the Gillings School of Global Public Health (Gillings School) of the University of North Carolina at Chapel Hill (UNC), an independent third-party, to conduct an after-action review focused on how NCDPH collaborated with state and local public health, medical, and emergency management systems to support the Helene emergency response operations in the western region of the state.

The goal of this After-Action Review (AAR) is to understand and evaluate NCDPH's management and response to Helene with specific focus on Emergency Support Function 8 – Public Health and Medical Services (ESF-8), as outlined in the State Emergency Operations Center (SEOC) Public Health Desk Standard Operating Guidance (SOG). Operationally, PHP&R's role is to manage the response through the ESF-8 Public Health Desk Representative and a Fatality Management Coordinator.

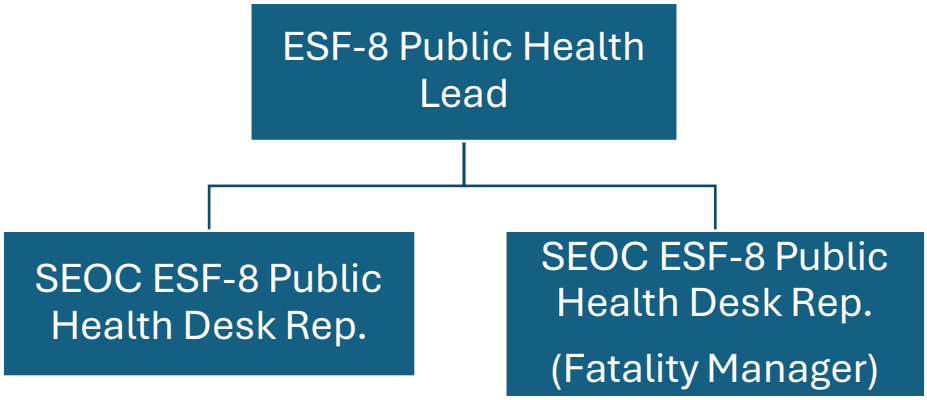

Figure 1. SEOC ESF-8 organizational structure.

Given the organizational structure, NCDPH commissioned AARs to assess general operations and, separately, fatality management. The scope of this AAR, therefore, is focused on general ESF-8 Public Health Desk operations, including activation, organization, operation, and demobilization activities by NCDPH.

As part of the contracted work, NCDPH commissioned this AAR with the following deliverables included in this report:

1. Conduct a survey of local health departments in North Carolina who were impacted by Crisis or supported response activities, including environmental health staff and shelter staff who were deployed as part of the Crisis response
2. Conduct up to 18 focus groups or key informant interviews with divisions within NCDPH, as directed by NCDPH
3. Develop a brief report summarizing the strengths, areas for improvement, and recommendations gathered from interviews and surveys
4. Develop a summary of the effectiveness in meeting identified PHEP capabilities, objectives, and Response Readiness Framework strategies.
5. Develop written recommendations for corrective actions based on root cause analysis, including immediate, short-term, and long-term recommendations.

Findings and recommendations were then shared with NCDPH leadership for review, reflection, and corrective actions.

D. Scope and Methodology

The focus on ESF-8 Public Health Desk operations required a broad assessment of NCDPH operations across phases of the Helene response, from activation to demobilization. These phases framed the AAR and were the focus of data collection throughout the AAR. Data collection consisted of a quantitative survey of local health department staff involved in the NCDPH response and qualitative focus groups and interviews of selected NCDPH branches

and sections involved in the NCDPH response. Data collected were summarized into key themes and findings of the AAR, which then informed recommendations and suggestions for improvement based on, where appropriate, an assessment of root causes and factors contributing to the findings identified.

1. Survey

The survey of local health department staff was designed to identify challenges and strengths of NCDPH's response within the context of local public health. This survey was designed to solicit feedback from 1) local health department leadership in counties impacted by Helene; 2) local health department leadership in counties who provided supportive capacity for NCDPH's response; and, 3) local health department staff who were deployed to impacted counties as part of the public health nurse medical surge, environmental health specialist surge, or support with public health laboratory testing. A total of 39 NC counties received a federal major disaster declaration and were considered impacted areas, with a total of 35 local health departments covering these impacted counties. Based on record provided by NCDPH, deployed staff included 83 Public Health Nurses (PHNs) and 90 Environmental Health Specialists (EHS) from a total of 46 local public health departments.

The survey instrument was developed based on pre-existing NCIPH surveys to local health department staff in order to characterize respondents, and questions specific to the Helene AAR were added for the intended audiences listed above. A full copy of the survey instrument is provided in Appendix A. Briefly, survey sections included: responder agency and roles; questions for all health departments on activation, coordination, communication, resource management, and NCDPH Response Functions; questions for local health department leadership in impacted counties; and, questions for deployed staff. Throughout the survey instrument, questions provided opportunities for open-ended feedback for explanation, additional context, and information.

The survey was open for roughly 4 weeks between April 21st and May 16th, with completions from 93 respondents from 40 local health departments across NC. Survey respondents represented 22 of the 35 local health departments in impacted areas and 31 of the 46 local health departments involved in the NCDPH response. Of the respondents who self-identified their role, there were 20 local health directors, 25 EHS staff, and 24 PHNs. Survey data were analyzed in aggregate to ensure the confidentiality of respondents, and results were used to inform findings, themes, and recommendations throughout this report.

2. Focus Groups

To identify the challenges and strengths of the NCDPH's response to Tropical Storm Helene, we held 13 different focus groups and key informant interviews with 59 individuals from various divisions within public health as well as external partners. All focus groups were held during April, 2025:

- NCDPH Leadership (April 7)
- Operations and Budget (April 7)
- Disaster Support (April 7)
- Communicable Disease (April 8)
- Communications Support (April 8)
- Environmental Health (April 8)
- Public Health Nurse Staffing (April 9)
- PHP&R (April 9)
- SEOC Coordination (April 10)
- Immunization (April 24)
- Pharmacy-MCM (April 28)
- Injury & Violence Prevention (April 29)
- Occupational & Environmental Epidemiology and the State Lab (April 29)

All focus groups lasted approximately 60 minutes and were conducted on a secure video-based recording platform (Zoom). Conversations were semi-structured, with an emphasis on questions across five major categories of response: activation, communication, coordination, resource management, and demobilization. Across each of these categories, focus group participants were asked about specific strengths and challenges, as well as their overall impression of how the activity was managed throughout the response. Throughout the conversation, participants often identified several suggested opportunities for improvement, which we have noted throughout the report.

Once all focus groups had been conducted, anonymized transcripts were made from a recording of each discussion. Members from the team developed a codebook to analyze transcript contents and thematically coded comments throughout the transcript. From these themes, observations were extracted and grouped to identify major themes across all of the focus groups.

3. Synthesis, Review, and Presentation of Findings

The findings from the quantitative and qualitative approaches were compiled into a single source of themes (observations), strengths, challenges, and recommendations. These observations and findings are followed by summative findings and recommendations are provided in section III of the AAR, broken down by phase of the Helene response. A root cause analysis (Appendix D) was conducted for the summative findings, based on review of existing planning documents, actions, and findings from the NCDPH Fatality Management AAR and other AAR and hot wash data conducted after Helene.

Findings and recommendations were shared with leadership from NCDPH in successive meetings with the Division Director and other key members of the NCDPH leadership team. Broader dissemination of this AAR will be at the discretion of NCDPH.

III. Findings and Recommendations

A. Activation and Demobilization

Observations

- Activation orders were viewed as distinct by internal NCDPH staff and ineffective by external staff, whereas demobilization was a more organic process as work scaled down in response to diminishing demand.
- Previous disaster experience, both tabletop exercises and actual responses, was seen as the single most influential factor in a unit's successful activation.
- NCDPH staff felt that a written mission outlining their assignments would have been helpful in ensuring their work was aligned with the broader response.
- There was a strong demobilization process by fatality management, given the clear benchmarks under which they operate.

Findings

Initial Activation Order

North Carolina Emergency Management was effective at notifying responding departments when it was time for them to mobilize. Notification occurred mainly through formal communications like emails and meetings, though occasionally responders were notified through less formal means, such as getting a phone call from a director while already deployed in the field. Still others felt they had to be aggressive to be involved, "forcing their way into some of these conversations."

Regardless of the method, the general internal consensus was that the activation was transmitted timely and clearly. Many departments anticipated the trigger. Having experienced the hurricane response process before, they knew to be prepared in advance of the formal declaration, stating

> *We had implemented an incident command structure 3 days prior to Helene making landfall.*

However, while the internal staff perception of activation was mostly positive, this did not translate to the response at the SEOC. External stakeholders largely viewed the NCDPH activation as non-existent, stating they were essentially unable to transition out of a blue sky mindset in an effective way. When attempting to discuss the process of demobilization, one external partner stated:

> *… we identified infinite challenges on activation. So … if you never really activated, you don't really demob.*

and

Out of the gate, say the first 45 days … They kind of didn't pivot to the situation. They never engaged to the gravity of the situation at hand. They kind of kept the status quo. They didn't adapt and didn't bring things in … you have to adapt to the situation and do the best you can. They just never came out of the blue sky mindset until it got to a level where they were comfortable with operating it.

Staff Training, Exercise, and Experience

During the activation, the most important factors in success were experience and preparation. Both real-world and simulated experience were major assets.

> *There was definitely a pretty big difference in individual person's preparedness depending on if they had done a hurricane before COVID…if they participated in COVID, but had not done a different emergency pre-COVID… the FEMA training, PIO training tabletop exercises organized by PHP&R, I think it really showed in terms of building those structures quickly and streamlining approval processes people who had been through that previously.*

Given that there can never be an established step-by-step manual for each unique emergency response, those who had previous experience could apply it to broadly shaping the response preparation, making it easier to function once engaged in recovery.

However, the gaps between experienced and inexperienced staff posed considerable challenges. Response was impeded when experience or processes were lacking in certain areas, which had cascading effects throughout the incident. For example, not anticipating that there would need to be a broad range of communications options available meant that some groups were unable to coordinate when the primary methods went down.

> *There was literally no one to pick up a phone on the other end. I think it's hard to activate when you don't know what's happening, and you can't communicate with those other groups.*

Other times groups had to create new tools to handle needs that might otherwise have been anticipated if existing plans and staff had been tested through training and exercises, such as "the major challenges [of] building [the] fatality management unit while we're flying the plane." At other times, groups were unable to act as a unit because they "would have folks kind of going rogue, because they were doing their own thing because they were wanting to do something quickly versus waiting for us to pull the trigger." These challenges can be partially attributed to staff not sufficiently experienced operating in emergency situations or not being properly trained on internal processes and protocols.

External partners also noted a lack of exercises as a contributing factor to the struggles they witnessed:

> *In my opinion, they need to do a better job of exercising each of these plans to find where those faults are before there's an incident, and I think they would have better*

clarity of then what is the next step when the plan fails. …maybe they do some of that. It doesn't necessarily feel like it because they get to a point and then the plan doesn't work and they become paralyzed, it feels like to us. So I think for going forward, knowing where those fail points are, and then what they're going to do when that thing doesn't happen.

No Written Mission at Activation

Following the activation order, there was a live meeting that communicated the nature and status of the disaster to the activated departments. Since this was done verbally, different departments would naturally focus on those areas of the response that were closest to their ambit and not always keep sight of the larger picture. As a consequence of the activation happening very close to the event, with "the first PHP&R call…the day after the storm," there was no time to establish a cohesive all-department response before communications and procurement had been impaired by Helene. A written activation order would have been preferred to ensure that all departments had retained the same information and expectations.

Outdated Procedures

Existing disaster planning documentation may not be able to handle the forecasted increase in disaster scale and frequency in their current state.

The limitations of these preparatory documents were that they were not designed for the level of damage and the speed with which it occurred during Helene, nor are they updated frequently to ensure they are current before they are needed. As an example, the ESF-8 section of fatality management:

Did not take into account such devastation, such immediate devastation. Just to characterize a little further, we've had these storms where we've had some warning, they're fairly slow moving, they're not so intense, but here we had a very intense localized disaster.

No Formal Demobilization Process

As a rule, departments and units did not experience a clear dividing line between response mode and deactivation. Unlike with the initial mobilization that included formal messaging, demobilization has been a more gradual, self-determined process of reallocating resources back to more routine tasks. Some groups are not sure whether any of their activities are still considered under the umbrella of Helene response or just part of their normal workload, stating "some of our agreement agendas for Western North Carolina may still be open."

At the time of the interviews, participants reported still having elements of the disaster response coming in through the form of payment codes, meetings, reports, and other non-deployment roles that are less clearly delineated from their pre-Helene roles. Others reported that demand for their services from affected areas dropped, but not in a distinct way.

> *Nobody calls you to say, 'Hey, I don't need you today.' They only call you when they can't meet their need. And so I think that's probably how it, like you said, trickles off. Just less and less phone calls, less and less needs, because they're able to fulfill their own needs.*

For departments that had clear changes in their status or function when activated during a disaster, there were generally established protocols for items such as notifying staff that their role was complete and their service was over. For those out in the field, the department "in partnership with PHP&R, have a demobilization process that we provide for every person…that goes to a shelter through our system." That system involves the department sending "them the demobilization email, all the materials they need" to allow them to stand down. The units that directly oversee those who are out in the field had less distinct boundaries and would make decisions internally about resource allocation.

Participants expressed interest in a declaration of demobilization as "it almost felt like some closure was needed" but many also recognized that work is ongoing in the affected areas, particularly on the roads and power infrastructure, and that would make demobilization announcement premature or disruptive.

One of the larger unresolved issues is the final allocation of material supplies. If doses of a given medication have been allocated to a county, for example, but they were not ultimately needed, there is no method for returning those doses to avoid them being wasted. Such materials also may not have had robust tracking, so the departments cannot be sure if they were used or, if they were not used, where they are being stored.

One key demobilization success highlighted by external partners was that of the fatality management team:

> *I think the fatality management group did a really good job with their demobilization … it was a well thought out, good plan. We had very clear objectives. This needs to be accomplished, then this needs to be accomplished, and then we can demobilize. And so I do think that in the fatality management space they did a very good job of demobilizing, and they understood the objectives that needed to be accomplished to be able to say, Okay, now we can safely demobilize.*

No process existed to determine recurring meetings no longer had utility.

An absence of clearly defined ownership and decision-making criteria for meeting continuation or termination was highlighted as an issue in demobilization. The state did not want to assume when meetings had lost their utility, and the counties did not proactively assess or discuss the necessity of the meetings. The lack of structured evaluation mechanisms led to indefinite continuation without a formal review. A hesitancy existed in hierarchical decision-making, where state leadership deferred to the counties out of caution, while county-level entities lacked either the authority, initiative, or structured metrics to reassess value. Without explicit triggers—such as participant feedback loops,

impact assessments, or predefined review intervals—meetings persisted out of habit rather than necessity.

Summary Findings and Recommendations

Activation orders were distinct while demobilization was a more organic process.

The distinction between activation and demobilization was a sense of urgency. Internal activation orders were driven by immediate operational needs and directives to mobilize personnel and resources. The State's emergency declaration functioned as a "structured trigger", though the NCDPH activation within the SEOC was viewed much less favorably than internal orders. Demobilization, on the other hand, was fluid as the response phase transitioned into recovery, when priorities shifted, and operational demands gradually decreased. Instead of receiving a precise order, teams naturally wound down their activities based on evolving conditions, resource availability, and informal decision-making.

Recommendations

- Implement a NCDPH incident action planning process that develops a uniform set of information and goals pertinent to every department to ensure that they operate in concert.

- Develop a demobilization annex in existing plans that establishes objectives, considerations, final resource planning, and a communication plan that articulates the demobilization process in advance.

- Develop a standard exit report that departments complete to summarize response and indicate standdown.

Disaster plans were outdated and limited in scope and scale.

While some aspects of existing plans were functional and useful, generally speaking, NCDPH plans were severely limited in scope and scale. The documents were unable to account for a no-notice event and did not consider that storms are trending larger and more catastrophic.

Recommendations

- Develop and socialize a time-delineated schedule that outlines response activities by anticipated timelines, including the ability to scale for no-notice events.

- Update plans to be scalable for disasters of varying sizes and ensure all responding units of NCDPH are included in roles and responsibilities.

- Socialize and update plans with all NCDPH sections on an annual or bi-annual basis.

Experience, including training and exercises, as well as participation in previous disaster responses, was seen as the single most influential factor in successful activation.

Experiential learning played a critical role in activation but was not sufficient to ensure rapid decision-making and operational confidence during the atypical event. Individuals with prior experience—whether through real-world responses or structured simulations like exercises—were better equipped to anticipate challenges, apply lessons learned, and navigate logistical and communication hurdles effectively during high-pressure conditions. The familiarity reduced hesitation and enhanced adaptability, as seasoned responders drew from past successes and mistakes. Previous staff participation fostered stronger networks and cross-agency coordination, minimizing inefficiencies in mobilization.

Recommendations

- Conduct scenario-based exercises between disasters that provide advanced preparation, including identification of worse case scenarios, to develop process for contingency planning, with the realistic expectation of future extreme events.

- Engage and empower specialized personnel from within and outside of the state, embedding them to guide department heads.

- Develop training and exercise plans for all staff within NCDPH that have or may have a role in future response activities.

B. Coordination

Observations

- Participants emphasized the importance of established relationships and good rapport with other branches at NCDPH, within the State, and on the ground.
- Branches that normally do not play a significant role in emergency response experienced unclear expectations.
- Public health was perceived as inflexible, slow to adapt, and lacking in a response mindset, leading to challenges in addressing the urgency of the situation.

Findings

Lack of Response Posture

Both internal staff and external partners indicated concerns with NCDPH's lack of response posture, though the perceived impacts to the incident varied by role.

Some internal staff spoke to the challenges of continuing to do their regular job while also participating in the response effort, especially where the organizational structure might be different and/or less clearly defined compared to their day-to-day role. If the organizational

structure is different during an active response, it would be helpful for that to be more clearly outlined.

> *Because I wasn't their supervisor. Technically, if we were in a regular command structure, I would not have been their supervisor in this incident … but we didn't do that. We continued doing our day jobs. And then we did this also. So you know, it was a little different, I think, if we're to all … stop doing our day jobs to do the function of our unit and have a reporting structure in that unit that would have been different than how we operated.*

For departments that did not have a clear break from their normal activities as part of activation, balancing the mundane workload with the additional work from the disaster was more of a fluid, self-determined process.

Additionally, another participant mentioned that scheduling for a response could be difficult because

> *People still want to have their everyday life. When people are sending in their availability, it's their availability on their regular schedule. So I can work Monday and Tuesday, but I can't work Wednesday because my kid has a soccer game. And so we have to continue to get our staff to understand when we are in response, we have to drop things too, and sacrifice to help those who have lost so much.*

There was a clear call to reinforce emergency response mindset among public health representatives in the SEOC. External partners called out issues with scheduling that they view as a resistance to adjust to a response mindset.

> *… we have a hard time with, you know, when the schedule comes out and we're gonna be working 7 Am to 7 Pm, or 7 Pm to 7 Am or whatever, and their staff comes in somewhere between 8 and 9, and leaves somewhere between 4 and 5. Or there isn't anyone there. I think that is probably the biggest challenge that we've seen.*

This was attributed largely to a difference in organizational culture, specifically one that does not emphasize the need for responder readiness or a call to swift and decisive action.

> *There's definitely a culture mindset difference in that [we] come from a public safety background. We're used to being on call. The pager goes off and you jump, and you go immediately, and you do whatever you have to do to fix the problem. And that is the way we've grown up. That is how we worked for years. And that is the mindset that we're used to. And I think that's where we sometimes get frustrated … they don't operate on an emergency timeline. They don't operate this immediately, "gotta do something and be decisive" type thing. And again, I do think it's very much a different culture in that when we activate and do these things, I'm going to be there 16 to 18 hours a day. This is going to go on for weeks on end. You tell your family I'm not going to see you. You cancel your vacations. There are no other things. This is what*

you do versus … "Well, I got there about 8,45, and then I had my Starbucks, and then I had to go jump on a call with my kids teacher, and then I had to be back, for I had to leave by 3 to go pick up the dog." Those are not things in our world, and … to me that's unacceptable in that if you're expected to be in an emergency role, I need you dedicated to this event … that is the mindset and the culture that we come from … That you give a hundred percent of all these things all the time. And that's just not the thing.

and

It got to a point where we just pushed it to [agency redacted] because we knew it was gonna get acted upon and handled. And then again it goes back to, they just didn't pivot … But it's more of a cultural issue … You know they're regulatory. That's their mindset, and I get it. However, you know there's times where regulatory takes a back seat, and action is required because we got to save some lives here. So it's just one of those things where they just didn't perform where they needed to out of the gate.

The lack of a response mindset combined with inflexibility, addressed in the next section, led to SEOC partners sending what should have been NCDPH assignments to other entities they trusted to complete the work.

External partners also suggested a revamp of NCDPH's response unit to ensure it is appropriately focused and properly aligned for response activities:

There's other state agencies [that] recognize that they're not equipped to handle a situation like that at all. So they are in the processes of developing … some form of response unit, preparedness response group, a new branch in their department or division that - this is what they do. This is going to be their function, moving forward. They come in to State EOC, they handle emergencies … And they're gonna be that new function because they know that another hurricane is coming, another disaster is coming … So they're developing the tools, the people, they're getting them trained up … to be able to pivot from blue to gray and to handle the situation that's thrown at their agency themselves … That may be the answer for public health … Or change something different, you know. Make a special unit or change current processes or something, you know. To make sure that pivot happens.

Lack of Flexibility

Members of external partner agencies expressed consistent and strong frustration with how inflexible and unresponsive public health was during the response effort, especially in the beginning, including a felt sense that they did not appreciate the urgency of the moment and the need to rapidly evolve plans.

They have a plan, right? Their plan is we're going to send an email. And hopefully, people will raise their hand and say, yes, I'm willing to be a public health nurse to go help support in another county. When that plan fails, it's literally like [they throw their] hands up. What are we going to do now? And they don't often even share that. It's just

like nothing - complete silence…Whatever your plan is, there's going to be a twist or a turn. It's not going to work. You got to adjust, and I don't know that they know how to adjust.

Their hearts are in the right place, and they know a lot. They're kind of scientists and clinicians and physicians and all the above. In our world, it's a little different, you know. You got to come out from the microscope, and you got to…lay hands upon people and literally save their life in our room, and they have to pivot to that situation and just get things going. If they don't, if they just try to stay in their silo, and they remain siloed for the rest of the way, they're not going to be successful.

Flexibility, I think, is a good way [to describe] it. It is very much, they do their one thing, … and it kind of freezes and stops there. So I do think the flexibility, the ability to pivot and make a new plan or change direction.

Many within NCDPH also felt that the structure for communication was not flexible enough for the situation. The established procedures and incident command structure did not always allow NCDPH staff to respond to requests in the way that was needed. As one participant stated,

The incident command structure is meant to give us some organization, structure. But folks have now applied such rigidity to it that …structure is not even the word anymore. It's concrete. It does not bend, it does not move…You have to work so hard to get through the different systems…This level of rigidity actually creates failure. …We aren't communicating across the incident command system or incident command structure as effortlessly as we should. And we're not flexing the incident command structure when new problems present themselves. The structure itself could allow for a lot of innovation and creativity. That's why you build things onto it. But we've created something that's just far too much concrete that it's hard to manage in it. It's hard to move in it.

For example, there were instances in which the communications team received requests for information from communities, but did not receive support from the SEOC as it did not align with the State priorities at the time:

When we were wanting to print content… I called over to ESF-8 desk to say, can you print this stuff for us? And we were told this is not a priority for us right now. But at the same time communities were saying, where do I get formula? …They had some real needs. And so we felt like we had to kind of take that into our own hands because there was no mechanism for us to get that out.

Interpersonal Skills and Collaboration

Interpersonal skills, like communication skills and empathy or compassion, as well as strong working relationships with others, within and across departments, were recognized as highly important in this work but were also noted to be lacking amongst some groups. One

respondent spoke about "people skills" and how important it is for people in leadership to be approachable,

> *But we're approachable. And we have people skills. And I'm just going to say it, leadership in this instance at PHP&R had no people skills, and they were not approachable, even from me. I didn't feel like I could approach them and plead a case for anything without it being automatically shut down. And in a position like that you have to be personable and understanding and flexible, and adaptable. And those things were missing, and have been missing for quite a while.*

Having relationships with colleagues in other departments also proved helpful, especially while traditional communications channels were down, for getting in touch with staff in the affected areas. Having some kind of rapport with other staff in other areas of the state helped connect people through their personal networks,

> *I think that what that did do, though, is we saw this internal grapevine and these folks that know each other really well, saying, 'Oh, gosh! What about so and so?' And so it prompted us to reach out to our contacts and say, via personal contacts, or whatever, like I was reaching out to folks I have worked with from NCEM during COVID to say, 'I know you're out in the West. Have you talked to your emergency management director at such and such county, and have they heard from their health director?' So that's how I was able to find one health director, was leveraging personal contacts to find folks instead of looking at a list, or whatever it is. It was the grapevine at its finest hour, I think.*

Existing relationships and contact networks provided an opening for impacted LHDs to request assistance through less formal means, at a time when the established avenues for communication and assistance were overwhelmed. Normally, LHDs were accustomed to submitting resource requests through WebEOC, but since LHDs often did not have internet connection, this was not always possible. LHDs were instructed to go through their emergency manager for resource requests, but emergency managers were prioritizing more urgent issues such as search and recovery, and some public health-related requests were being denied. As a result, LHDs were also making requests over the phone to their contacts at NCDPH, who would then work with the SEOC to make sure the requests were met, without duplicating efforts:

> *Some of the health departments found it far more effective to talk to [one of us] than trying to get through to their emergency management to do something…because they're supposed to work through their emergency management to get something into WebEOC, and because of the sheer magnitude…of what was going on, your public health needs might not be right at the top. So they're having to struggle to get seen, to get things in, and so it was far more effective for them to talk to [one of us] to try to get things through, what's called the ESF-8 desk, directly through us to NCDPH.*

Working Relationships with other Departments and Agencies

Encouraging a culture that supports collaboration, flexibility, and availability proved to be a sustaining component of productive teams. Strong established relationships across divisions or units helped staff work effectively together as needs changed during the response:

> *I felt one of our strengths was strong established relationships with NCEM, NCDHHS, and NCDPH. This allowed for quick coordination, response to a rapidly changing situation, and adaptation of resources to meet the needs of the response.*

Partnerships between offices and divisions were beneficial, because having good relationships with counterparts across teams enhanced the quality of communications and encouraged opportunities to discuss potential for improvements.

> *I think, while this may not be very specific it underlies everything, and the partnership that we have between the Office of the Chief Public Health Nurse and PHP&R is really, really, really important, and serves well, and is always open to change and improve and everything, so that relationship and collegiality and partnership is super important for communication.*

External partners also highlighted the relationship with NCDPH as a success of the event:

> *I think we … have great relationships with all of our partners. … we all know each other very well. So we always know who to call. And it's very easy to just pick up the phone. People answer. So from a coordination standpoint and a relationship standpoint, that's where we really excel.*

and

> *We got through Helene because of our working relationships with each other …*

On the other hand, communication and collaboration with some groups did not go as smoothly. For the Environmental Health group, communication with NCDEQ was a challenge:

> *Several wastewater systems were destroyed, and we were trying to come up with a plan to open childcare, schools, other establishments that didn't have an operable wastewater system. And we were trying to get some help from NCDEQ to make sure we did this in a way that didn't create issues for them or create issues for the environment. And we just, we went on weeks and weeks trying to resolve some of these issues. And I just felt like we had a big communication breakdown with our sister agency that hopefully will be better the next time we have this sort of thing.*

The immunization group talked about working with the CDC and their "no ship" zip code list. At first, the CDC provided a list of zip codes that could not receive shipments. Over time, NCDPH was more in touch with which facilities were able to receive shipments and which

were not, and they were the ones informing CDC. However, the CDC did not formally communicate that they were not updating the list but relying on NCDPH to provide updates from the ground.

Coordination with agencies managing emergency shelters was a commonly cited issue at the local level at various sites. Specifically, there was uncertainty about management of at least one emergency shelter, with management changing from NCEM to Red Cross back to NCEM. Other experiences at the local level spoke to challenges coordinating with certain Red Cross staffed shelters, reinforcing the lack of understanding of roles and responsibilities described later in this AAR. As with other local experiences, there was variability where some respondents reported effectively working with Red Cross and other shelter management.

There is a need for more collaborative partnerships across departments, agencies, and work units to help establish relationships that can be leveraged to enable efficient responses after an event. Nurturing and supporting relationships like these, outside of an active response, can help foster a smoother response to any future events. For example:

> *So I think, just from my perspective, a general sort of pharmacy comment would be that our board of pharmacy is amazing and does a lot of awesome things for us during a response, and that was a huge plus during this response, and a huge benefit for us to have such a strong board of pharmacy. Our pharmacist association in this state, the North Carolina Association of Pharmacists (NCAP). We did end up pairing up with them, and they did help organize some meetings and send out some communications. That's not a partner that we typically worked with before but is on my list to try to help enhance that partnership during, and work with them during blue sky time, so that we're more in lockstep during big responses like this. That, I think, is an opportunity to strengthen a partnership to make our lives a little easier in the future.*

Difficulties with Decision-Making

Communication from leadership was viewed at times to be unclear, contradictory, or too slow. There were also reports of conflicting priorities and uncertainty about whose directions to follow:

> *… we just got direction from different leaders at different times, so that's all.*

There was sometimes a disconnect between those who had a deeper understanding of problems and needs on the ground, and those who would have a final say in decision-making. This disconnect would sometimes slow down responses and cause frustration. One participant described the situation:

> *So you're trying to do what you have in your process and your plan that you have. You have people that have been working this for days, and so they know the need, and they know what needs to go on. And then you get feedback from leadership. And [things] change, of course, to appease leadership for whatever reason, sometimes*

that can be a little frustrating, and that changing direction can just kind of change things up and make it stressful and make it longer days.

There was also a concern about communicating information to the media. In one specific comment, someone explained this concern noting that when death data was first being reported, it seemed that leadership wasn't clear on which details should or should not be reported,

> *I think there was some leadership that did not, was not aware the type of detail on the decedents that we were sending out publicly. And so just making sure leadership's on board, knows what's going now, now that we are, you know, outside of the urgent urgency and the emergency response, just knowing next time we shouldn't send that level of detail in the deaths to media*.

In the Environmental Health focus group, participants perceived that there was *"tremendous pressure"* from higher up to open businesses and services such as restaurants, schools, and childcare centers, which would require them to "[stretch our] regulatory authority", and "allow certain things to open without…normal safety protocols." In this situation, the team felt that they received unclear guidance from the top-down, which created a lot of stress on the team. The contradictory guidance also resulted in at least one person in a local county being put on administrative leave. That person followed guidance given to them by NCDPH, which later changed, and the individual was placed on leave as a consequence of apparently following those initial guidelines.

External partners were likewise critical of slow decision-making within public health leadership and with those assigned to the SEOC where decisions were often delayed by going to higher levels of their blue-sky chain of command:

> *We need a person who can make a decision because not making a decision leads to paralysis and even bigger problems. And then this whole decision by committee, and let me call 17 other people, and let's have a meeting about it and make a decision - that is not a thing in the emergency response world. And that leads to more problems. And the point of the state EOC is to bring the partners together physically together in the space … where I can literally look them in the eye, have a conversation, and somebody make a definitive decision now to move on, and that is not the case when it comes to our partners at public health*.

In response to this, there were a few people in public health that external partners would consistently reach out to for questions and requests—"there are 2, maybe 3 people in public health that I know I can pick up the phone and they will answer, and they will get things done"—even if it meant going above or around the formal chain of command:

> *I'm going to be honest. I went above them. I completely bypassed them, and I went straight to Kelly Kimple, who's the division director, or directly to a deputy secretary or*

the secretary, and said, these are issues, and they need to be addressed because we were unable to get that coordination or communication with them, and so to be effective in what needed to be done. We just went above them.

and

From my perspective of truly trying to sit at the desk and fill requests, I didn't go above. I just went around. I would just call a local Health Department direct and say, What do you need, and then try to work with them to figure out how to fix this … eventually I just said, You know, it is what it is. Let's just make it happen because these people need it. So for me the coordination was just go around, go direct to the source.

External partners attributed some of NCDPH's struggles with decision-making in the SEOC to where the response arm of NCDPH sits in the division's organizational chart:

Because of where they sit in their system, literally, the head of the program has to go to an assistant section chief who has to go to a section chief who has to go to an assistant division director who has to go to a division director, who then at times felt the need to go to a deputy secretary, and that is ineffective when you have to make a decision, go through 6 or 7 layers to get those answers. And the expertise often lives at that program level because everyone up the chain may not fully understand the plan or the processes. And so it was very slow to get decisions because it was a lot of, well, let me explain what we're doing. Well, this is how it works. Okay, well, let me pass this on to the next person, and I think that adds to sort of the difficulty.

This sentiment was echoed by internal staff as well.

Lack of Role Clarity

Some branches felt that, especially in the beginning, expectations about their roles in the response was unclear. This was particularly true for those branches that are not typically involved in disaster response. One participant described a lack of clarity in expectations for their team: "I do not believe that it was perceived… that they had clear communication from the top… what they were supposed to do as far as supporting response." There were instances in which greater role clarity was needed between two or more different branches. For example, the State Lab was responsible for analyzing samples from private wells, but it was unclear in the beginning whether the State Lab or the Occupational and Environmental Epidemiology branch would be responsible for pulling together reports and interpreting the data.

A repeated suggestion for improvement was to do more training, outside of active response times, to help clarify individual roles and to help people prepare for mobilization so that everyone is ready and not scrambling to try to figure things out during the response.

And I do think that the role of the public health nurse for the local level staff and management, they continue to kind of struggle with what that is, and kind of what their

role as a health department as a whole is. So that – and I'm not saying we did this … but I feel like we can't wait until we are in the disaster situation for them to be figuring that out.

This came up particularly with respect to nurses who join response efforts, but the idea that everyone could use more training and that there is no such thing as being over-prepared came out clearly.

And that's part of what we saw that became a little tough for us, because we were then in the role of trying to provide them support. And I recognize that this was a really unprecedented storm, and that part of the state was not accustomed to dealing with some of these things they were dealing with. But I feel like we can work on that area of training and doing drills. I don't think you can overtrain and overprepare because it's still going to be chaos when the event occurs, because that's just that's what a disaster is.

I think the messaging needs to come from someone else higher up, but the nurses and the local health departments have got to be involved in preparedness and response, because when they're bought in and they don't have any contacts, and they don't know what they're doing, it makes for a very confusing and possibly dangerous or risky situation for a nurse. So they have to, and I know of a few counties that involve them, but I- if there could somehow be a way to get the- while we're still doing the nursing and the shelters, the nurses must be involved in the planning, in the communications. And I would say one nurse per county, not just per Local Health Department, needs to be one nurse per county so that they, kind of like [name removed], is the person who has a percentage of their time to be involved so that they can provide direction to the other nurses, they can help ensure that the right policies and protocols are in place because there were … some shelters that didn't have any policies or procedures or protocol as far as the Public Health and health side because a nurse … may not have been involved in the planning. So, that is an area of opportunity that we can demonstrate just from … our side of the fence with [name removed] and [name removed], and everybody else's side of the fence, how we bridged that! And … we've had a lot of success, but that needs to happen in every county as well.

Some participants noted the importance of setting realistic expectations during an emergency response to an event with such severe and widespread impact. For example, people who were deployed to shelters would sometimes arrive expecting accommodations, such as hotel rooms and hot meals, but these were not available:

I worked in the shelter for a few days, and one of the things that did not work well was when we did deploy folks, there were a lot of expectations from the folks we deployed that were not realistic. We were – it was catastrophic. Folks were wondering, 'Where am I going to stay? Why am I not in a hotel? What do you mean all I have is a cot here

in the shelter?' That's reality. And we did not prepare people for what a deployment really was going to look like in a catastrophic event.

Learning Curve for SEOC Members from outside North Carolina

External partners expressed consistent frustration with SEOC members who arrived from out of state and who did not know North Carolina's systems, and difficulty bringing them up to speed (though a particular group was not identified):

> *Basically they brought in staff from other states and staff who had never been involved in a North Carolina response and put them in the decision maker seat at the State EOC, which made it incredibly difficult to coordinate and organize resources.*

In response, they desired for improved onboarding process for individuals in SEOC who come from out-of-state and who aren't familiar with NC operations, and to ensure there is someone in charge of each team who has some experience working in North Carolina.

Meeting Management

Though meetings to check in and coordinate efforts are important, the meetings and the meeting schedule need to be well managed. NCDPH leadership held regular internal coordination meetings with all the branches, which provided a common operating picture. These meetings allowed participants to learn more about how other branches were responding and also fostered a sense of teamwork:

> *I really appreciated the daily briefings that we had internally to check in across parts of NCDHHS on various things that people were doing. I think it helps to foster a sense of teamwork, and… get a quick update and you go through what everyone's doing.*

NCDPH also set up daily all-county meetings with LHDs. These meetings provided an avenue for bidirectional communication, allowing NCDPH to collaborate with LHDs to assess needs and determine which services would be useful. NCDPH was also able to gather information about which LHDs were open, which were closed, and what services each was offering, in case they had to reroute patients or supplies. LHDs also felt that these meetings were helpful, once they had reliable phone and/or internet access and were able to attend.

However, participants also noted that there were many meetings scheduled, and those meetings took up time that would be better spent doing other work. Some felt that many meetings were repetitive and not useful:

> *So it was most of the time… maybe we answered one or two questions the whole time the calls went on. It was mostly just blank air. And I wasn't in all the meetings, but I was in a lot. But there was multiple meetings each day, kind of repeating the same messaging.*

Eventually, the meetings were held less frequently:

> *We made some good changes where we downgraded some meetings and got rid of some that we didn't need, which was really good, because it gave valuable time back to people to actually do work instead of meeting to do work.*

Meetings to coordinate are important, but scheduling frequency needs to be weighed against the usefulness of the meetings with recognition for the fact that meetings do take people away from work for that time. Careful attention should be given to the progress of the response and how productive the meetings are so that they can be scaled back when no longer needed so frequently or cancelled when no longer needed at all.

Meetings should also be evaluated to determine who should be required to attend and who may be optional, as well as an agenda to outline meeting expectations. While many people in the response may have useful information to share, briefings should be streamlined to allow for productive dissemination of information rather than lengthy conversation. Regarding expectations for attendance in meetings, NCDPH staff stated:

> *We started seeing new meetings added to our calendars, and there wasn't a lot of explanation about who really should attend those meetings... the communication was going to certain people, but it didn't go to all of the people involved. So we were kind of left wondering who should actually attend these meetings, without sending everyone to the meeting or sending only the key people that need to go to the meetings, and understanding the purpose of all of the meetings.*

Summary Findings and Recommendations

Branches that normally do not play a significant role in emergency response experienced unclear expectations from NCDHHS and NCDPH leadership.

An absence of established emergency-specific guidance for departments outside traditional response roles was identified. Leadership within NCDHHS and NCDPH focused primarily on core response teams, unintentionally leaving supporting branches with ambiguous expectations. Without clear directives, those departments interpreted their roles on the fly, leading to inconsistencies in decision-making, delayed coordination, and inefficiencies in execution. Pre-incident preparedness, training, communication channels, and procedural alignment were not sufficiently integrated across all branches. Without proactively defined emergency responsibilities for less-involved teams, they struggled to understand their function amid rapidly shifting priorities.

Recommendations

- Develop a division wide response plan that integrates all branches/departments, defines emergency roles and responsibilities, outlines expectations and decision makers, and emphasizes a richly “socialized system” as a clear goal.

- Ensure that department and division directors, as well as response leadership, understand the importance of each branch's role in the response and identify a structure for supporting their roles.

Public health was perceived as inflexible, slow to adapt, and lacking in a response mindset, leading to challenges in addressing the urgency of the situation.

Misalignment exists between public health's structured operational approach and the dynamic urgency of immediate crisis response. Public health followed regulatory frameworks, data-driven processes, and blue-sky chains of command that created challenges during the rapid crisis response. Early in the effort, adherence to formal assessments and approval protocols contributed to delays in addressing urgent field needs. Unclear communication and decision-making channels further strained coordination as standard procedures are designed for and work best in long-term strategies, whereas a more flexible and adaptable approach works best during fast-paced emergency events.

Recommendations

- Reinforce emergency response mindset among public health reps in SEOC with clear understanding of obligations and responsibilities while on duty in SEOC

- Develop clearly defined/empowered decision-making processes among public health representatives in the SEOC.

- Implement scenario-based training where plans fail and must be quickly adjusted to reinforce rapid decision-making, flexibility, and adaptability.

- Evaluate operational organizational chart to determine and socialize gray-sky chains of command and reporting structures.

- Conduct targeted briefings, prior to deployment and during regular touchpoints, on SEOC roles, response expectations, and coordination protocols to ensure public health representatives understand their emergency response obligations and decision-making responsibilities.

- Develop a Continuity of Operations plan for each branch within NCDPH to assist staff in prioritizing which of their daily tasks can be paused while in an active response.

Public health staff were frequently contacted for questions and requests, sometimes bypassing the formal chain of command to expedite response efforts.

The presence of informal networks compensated for inefficiencies in formal communication pathways. Certain individuals in public health consistently became the go-to contacts, despite established chains of command, suggesting that the formal structure was too slow, unclear, or perceived as ineffective for urgent requests. This reliance on specific individuals often resulted in direct, faster solutions. While these workarounds enhanced efficiency in

the moment, they also undermined structured decision-making and created bottlenecks, relying on a handful of individuals rather than a scalable system.

Recommendations

- Establish a structured process for identifying bottlenecks and making rapid adjustments to support efficient response and minimize informal networks. To accomplish this:
    - Deploy Rapid Assessment Checkpoints – Schedule routine operational reviews at key intervals to identify emerging bottlenecks, and
    - Establish a Real Time Adjustment Team/Individual – Assign dedicated individual or team representatives within the SEOC to monitor response effectiveness, document process inefficiencies, and facilitate immediate problem-solving.

- Conduct exercises that mimic real emergency conditions, including operational reviews at set intervals to refine rapid assessment checkpoints and decision-making processes, including analysis of past bottlenecks, proposed solutions, and rehearsal of rapid-response adjustments in a controlled setting.

C. Communication

Observations

- Damage to communications infrastructure created enormous challenges to communicating with those in impacted areas. NCDPH staff had to be flexible and creative in establishing and maintaining contact with LHDs and other local partners.
- Overall, there was strong communication within NCDPH. Participants appreciated their teammates' availability and flexibility, and felt they worked well together to implement creative solutions.

Findings

Internal Communication within NCDPH

Internal communication within branches at NCDPH was considered a strength overall. Participants appreciated their teammates' availability and flexibility. Several participants spoke of "constant communication" across their teams or of being available to each other 24/7, which allowed them to problem-solve to meet the needs of the impacted counties. They used a variety of methods to contact one another, including phone, text, Microsoft Teams, and email, depending on what would be the most effective. One participant summarized the strong communication within the Environmental Health branch:

> *I think the strengths for our team is we work 24/7 and we're always available. So I can't say enough great things about that. And not just in emergency situations. I mean, the team's always like that.*

Participants felt that they overall had positive working relationships with others on the team, reached out to each other when needed, and worked together to respond effectively to a variety of requests.

Communication between branches within NCDPH was also seen as positive overall. In particular, participants from the PHP&R and Environmental Health branches felt the two teams worked very well together on the environmental health response:

> *I would work with all those folks again in a heartbeat, hopefully not under the same circumstances. But they were great to work with*.

Participants from the Injury and Violence Prevention branch also felt that they had good communication with the Epidemiology and Environmental sections, as well as with NCDPH leadership.

Consistency in leadership and across teams supported strong working relationships, and staff conveyed how helpful it is to know the other people involved. Additionally, there were people with a lot of experience in this type of work or who were well established in their roles, which was helpful in coordinating efforts, though everyone is always continuing to learn ways to improve processes for future responses.

> *We're very fortunate that at the moment within the Division of Public Health, our leadership is fairly consistent for our sections and things like that. And so, we have established relationships. And I think that's actually really helpful in a response like this, that people already know each other. And people already have experience. You know, we're all learning.*

However, several participants also spoke about the need for more guidelines and structured plans for communication, including what information to communicate, how to communicate it, and to whom.

Creative Communication Strategies

Effective communication with those on ground, including LHDs, other partners, and the public, required creative problem solving and flexibility. In one example, NCDPH staff leveraged established relationships and contact networks to locate their external partners at the LHDs:

> *We relied on...those personal relationships, you know, if we can't reach the health department, maybe there's one nurse who happens to have cell phone service and we can reach them.*

NCDPH used informal channels, as well as official ones, to receive updates from and disseminate information to those on the ground. They used cell phones, text messaging, Microsoft Teams, and Facebook messenger to communicate with others. Before LHDs were able to get online, local groups and individuals shared information and resources with each

other. Many colleagues were personally affected or had family who were affected and would hear information from those people on the ground:

> *It's very helpful to hear, from [personal contact] that the water's still not back on, or the water's coming on, but they've been told not to drink it. And so, there was a lot of that less formal communication, just because of how many people were personally impacted by the storm as well.*

The Communicable Disease team mentioned that they were also invited to attend calls with private sector businesses, and to answer questions and direct them to resources related to the health and welfare of their employees.

The NCDPH communications team expressed that, despite major challenges, they were able to effectively develop a system to distribute necessary information to those who needed it. The team did note that it took some time to work out an effective system, but they were able to do it.

> *We figured out pretty quickly how to engage and get information on the ground from what our partners, local health departments, etc., what some of their information needs were... we created a system for gathering what content was needed, figuring out who the subject matter expert is or whether there was existing content...pull the content together really quickly, pull it into a document, feed it up...to the NCDHHS Central comms to kind of look at it...then making it available in Spanish, and then quickly turning it back out.*

With phone and internet down, NCDPH utilized other tools for dissemination of information. Since one of the team members was in an impacted area, they were able to print content and distribute it to those on the ground. They also used radio stations, had couriers deliver materials, and even used local public libraries as information hubs.

> *Communication dissemination had to be flexible due to primary sources of communication being down. NCDPH came up with some creative methods to disseminate information via radio and through paper via existing State Lab of Public Health courier routes. In addition, utilization of public libraries as hubs of information was a great strategy.*

Some participants reported Starlink access being beneficial for staff to join meetings and communicate with other groups:

> *And so health departments were relying on Starlink, which was, I don't know that that was anybody's plan from the get go, but they had to adapt, and so what resources they could get, they were starting to use.*

Sometimes it was easier to drive somewhere to reach someone than to try to get to them on the phone:

> *I was trying to talk to the sheriff, and he wasn't there and so they couldn't get him on the phone because comms was down. I had to get in a car with a map and drive to another place that he was at, to go talk to him. So I think a lot of times it was a lot of, sadly, a lot of face-to-face communication, just because the limitations of communications and that made it difficult times [for] what was later 37, 39 counties. I think it just made it difficult, but it would have been nice to have lots of couriers or runners.*

One participant shared the suggestion for a customer relationship management system (CRM) that could be used to track interactions with LHDs and others, real-time progress updates, and any information helpful to staff engaged in the response effort as the situation evolves. This would be especially useful for units within NCDPH, some agencies within the State, and perhaps NCEM.

> *And I think it's almost like what the system needs and doesn't have is a CRM. And I know that this is an insanely expensive idea that I'm throwing out there. But I think the reality is the version that would have been helpful of our spreadsheet is a CRM type system where you can, say, everyone can see the Yancey County Health Department, and the last note that anyone left on the Yancey County Health Department is that the health director is being ATV'd into the office, and the only way you can get her is on her cell, and if you don't get her cell, keep texting until she responds… If there are four different units at NCDPH, and a whole different State agency in NCDEQ that theoretically needs to have some awareness, and NCEM as well, a central place to understand what's going on there, and people could leave notes and make documentations that do have information.*

To facilitate tracking updates, one helpful process was having weekly and daily situation reports shared with tracked changes to allow everyone to see new information and know when it was added:

> *And also we had a running update of the weekly and daily Situation Reports. So we incorporated Tracking Changes for new updates so that we could see when those updates occurred and we wouldn't have to go back and comb through all of the old Situation Reports to find a milestone or date when something new was implemented instead of reporting out on the same thing over and over.*

It was also suggested that state and federal agencies should coordinate messaging to the public and present accurate information with a shared understanding of the situation and information needs. This could avoid misinformation or mixed and confusing messaging, which came up as a concern. Another specific suggestion was establishing a representative in the joint information center (JIC) who can help coordinate messaging, like writing talking points and press releases, as well as preparing for media briefings:

So we're sort of working with NCEM on ideas of how to ...have training to be a representative of the department in the JIC be more a part of people's onboarding, and ...being a member of the JIC that is not solely representing NCDHHS, but just a member of the JIC at large who can write the governor's talking points, write a press release about anything, prepare a media briefing like that's sort of what you're there for, and you can give feedback as sort of a NCDHHS lead, and coordinate with NCDHHS when it's something like a fatality or a media inquiry or some NCDHHS specific information that needs to get out, but also serving more broadly as just a member of the JIC.

Breakdown of Communication Infrastructure

Communication with partners and the public in impacted areas was a major challenge, especially in the early days. Primary communication channels, including phone and internet were down across affected areas. In some cases, the radio network, Voice Interoperability Plan for Emergency Responders (VIPER), was the only way the county public health office was able to communicate with the state. In other cases, even VIPER did not work as expected. Local health department directors and staff were personally impacted, and some could not be contacted at all in the first few days.

But we just have to understand that across the area, communication was abysmal. Like it just was really hard. Especially in the most impacted areas, because you just could not talk to people.

Another challenge early on was sorting through an overwhelming amount of information and requests for assistance. It was sometimes difficult to know what information was real, what was not, and even who was the best contact person on the ground to provide reliable information. One participant talks about the challenges in finding out "ground truth" at the shelters:

It was finding out who the person was on the ground in the shelter who knew what was going on because we were- there was issues with no information and then misinformation. And so, finding who that person was in the shelter on a day-to-day basis, who had the information we needed before I feel comfortable saying this nurse can deploy, you know, that that was a challenge unlike we've ever seen in a storm before.

Another participant spoke about challenges coordinating with the National Guard to get certain supplies out the Western NC:

When I tried to track down the information, and who I could get the detail from it was a little bit of a chain of call this person, no, call this person, no call this person...So I was communicating with two different people from the National Guard directly, because the communication from them, through NCEM, through PHP&R, through my supervisor, was not clear nor detailed.

Lack of Proactivity in Communication with LHDs

Some felt that NCDPH was not proactive enough in reaching out to LHDs to find out their needs. Some participants mentioned that in the early days, they wanted to help but they had not heard from the counties and did not know what they needed. One strategy was to set up the daily all-county meetings with LHDs to learn about their needs. However, those LHDs that were the most impacted, and therefore most in need of assistance, were unable to attend. Some felt NCDPH was not quick enough to realize this:

> *From our state response, we were relying on things that we had always done before. Which was, we're going to convene a meeting, and we're going to ask people what they need. But we didn't adapt quick enough to, 'Wait a minute. The only people on here are the ones who were not impacted at all. How do we get to the folks who are actually impacted? What do we need to do?'*

Ultimately, those that were online used the meetings to strategize on how to reach those that had not yet been located. In the future, this strategy should be implemented as soon as possible to locate LHDs, so their needs can be assessed.

From the LHD perspective, the daily briefings and communications were viewed as a net positive, but some of the initial communication lapses and/or the lack of responsiveness to local requests and needs resulted in at least one county bypassing the typical chain of communication and helping counties in their region.

Summary Findings and Recommendations

Communication systems, especially with partners and the public in impacted areas, were unreliable with reduced or no access to internet and phones

The event highlighted the vulnerability of modern communication infrastructure during the disaster and the absence of robust contingency planning for widespread connectivity loss. Emergency conditions strained the existing communication systems (e.g., lack of internet access and reliable phone connections), resulting in a failure of critical communication infrastructure due to damage, overload, and resource limitations. The alternative VIPER radio network was insufficient to meet all communication needs. Traditional communication channels were not adequately reinforced with backup solutions. While radio communication served as an effective last resort, its limited accessibility among the general public and external partners further hindered coordination.

Recommendations

- Establish a multi-layered communications contingency plan (PACE plan) that integrates diverse back-up solutions, enhances interoperability, and expands access to emergency communication tools, such as satellite communication units, mesh networks to allow peer-to-peer connectivity (vs. centralized infrastructure), and FirstNet for prioritized communications, based on availability and accessibility in North Carolina.

NCDPH had to be creative in communicating with those in impacted areas

Staff reached out through unofficial means to communicate with others and found creative ways to disseminate information via radio, courier, and using local public libraries as information hubs. The agency lacked a sufficiently adaptable, pre-established communication framework for crisis outreach. During a public health emergency, traditional response protocols often prioritize official channels such as state-run alert systems, coordinated agency messaging, or structured emergency networks. However, when these avenues prove insufficient—due to infrastructure failures, access limitations, or procedural rigidity—responders must improvise, turning to informal methods to fill gaps. The reliance on unofficial communication tools (cell phones, messaging apps, local radio) suggests that pre-existing public health messaging systems either lacked redundancy or were not universally accessible. Additionally, the creative use of couriers and libraries underscores the need for decentralized information hubs when direct digital outreach is compromised.

Recommendations

- In future planning exercises, prepare for instances in which communications infrastructure has completely broken down and how formal information channels would need to be adapted or less heavily relied upon.
- Formalize the Disaster Support Unit to serve as dedicated liaisons to assist with bridging the communications gap between state operations and local needs.

D. Resource Management

Observations

- Resource management significantly varied before and after internet connection was secured—informal tools (e.g., calls, texts) and networks of support (peer contacts) were important when and where internet connection was unavailable, formal platforms (e.g., WebEOC) were too slow, or personnel to complete resource requests (e.g., emergency managers) were unavailable to do so.
- There was a lack of procedures for quickly and comprehensively tapping into external resources/assets.
- The lack of protocols for new procedures caused significant challenges in getting resources to those in need, such as the development of temporary vital records agencies, the lack of personnel on the ground with p-cards to make in-person purchases, and the direct-to-consumer process of distributing disinfection materials to residents.
- The western part of the state has not historically prepared for hurricane response to the degree that the eastern part of the state has, creating numerous resource gaps. Many personnel from the eastern part of the state volunteered to assist, which made a crucial difference.

- Mechanisms to estimate the need for environmental health resources were inaccurate and led to oversupply, with no method to usefully redistribute them afterwards.

Findings

Identification of State Contacts to Provide Immediate, Informal Assistance

Aligned with prior observations about the difficulty of formally requesting support, especially for environmental health staff, many LHDs with the greatest need valued having someone they could *directly* call or text for help, as opposed to going through formal channels of requesting support. While weekly coordination calls to assess needs proved generally helpful, there were instances where overwhelmed staff struggled to clearly articulate what they required. In those cases, direct texting and phone calls became essential. The most common staffing requests were for nurses, first responders, and environmental health specialists—people able to physically engage with the community—rather than more administrative leadership. One public health preparedness staff member noted how surprisingly effective informal communication was at surfacing urgent needs. Notably, communicable disease response took a backseat in the early days, as the primary focus was meeting basic survival needs such as food and shelter. The team recognized the need to recalibrate priorities accordingly, contributing to a shared assessment process that unfolded over time. Some LHDs found it easier to contact public health peers or a select handful of public health leaders at the state level rather than navigate emergency management channels or WebEOC:

> *And then when it came to actually, when they came back online and we had established this disaster unit to help local health departments, I'll just say, some of the health departments found it far more effective to talk to [one of us] than trying to get through to their EM to do something, or because they're supposed to work through their emergency management to get something into WebEOC, and because of the sheer magnitude.*

Readiness Protocols for Nurse Deployment

Nurse deployments benefited from existing storm-readiness protocols, such as advance surveys to assess staff availability. These helped them plan deployments efficiently and are seen as best practices moving forward. They also leveraged new technology tools, including a nurse deployment and tracker platform that facilitated coordination with the Office of the Chief Public Health Nurse. The system replaced older, Excel-based methods and gave a clear, user-friendly view of nurse placements, shelter operations, and staffing gaps.

Nursing staff were particularly enthusiastic about the tracker tool that was developed, describing it as intuitive and highly effective for monitoring where individuals were deployed and which shelters were active. It allowed for quick categorization and searching, and helped ensure all stakeholders had a shared understanding of operations.

I think a positive for me is our use of technology to allow us to do more things remotely than we were able to do before. I'm thinking specifically about nurse deployment and also the tracker tool that we built to track nurse deployment as a positive and a form of communication, because we use that to create that sort of common operating picture between us and the Office of Chief Public Health Nurse, who plays a role in that deployment process. And that worked really well for us this time around. There's a new tool, first time we used it and worked really well.

Personnel Support from Eastern North Carolina and Other Unaffected Areas

EHS staff across North Carolina stepped up impressively during the disaster response, with many volunteering to deploy and assist in affected areas.

> *Another positive is the fact that we had a lot of EHS from across the state in areas that were unaffected, that volunteered.*

Likewise, one overwhelmed Director of Nursing was connected to peers with hurricane experience from the eastern part of the state, highlighting the value of peer-to-peer support. In general, it was noted that North Carolina did not have the same depth of deployable emergency support (e.g., via EMAC) as states like Florida, which limited the state's ability to surge resources early.

There were also requests for greater involvement from as many of the local health departments as possible at activation, ideally "at least one person who has local public health experience and connections" to help bridge any gaps in local knowledge and experience.

External partners also discussed the NCDPH use of local health department staff in unimpacted counties:

> *… Some of the feedback that we have heard since Helene from [local] public health has been: They wanted to be more involved. They just didn't know how or what to do. And so we've been approached by some in public health to say, How could we get involved with you all so that we can deploy, and I think there's a real desire to help and support. But there's not a mechanism or a program for them to get engaged with on how that's gonna look and work.*

and

> *And just to clarify on that: The local health departments have reached out to us, saying we never heard anything from State public health. We wanted to help. And they are asking our program … how do we become involved? Because we want to do these things? It's not a state to state [issue], this is local partners contacting us at our level at the State, saying, we want to help on your side of the house.*

Gaps in SSP-related Supplies

Injury and Violence Prevention efforts were initially slowed by administrative delays, resulting in mutual aid groups filling gaps in supplies before official deliveries arrived. Despite hurdles, staff connected with syringe service programs (SSPs) in western North Carolina to assess and communicate needs to NCEM, helping streamline future ordering.

> *One member of our team was able to personally communicate with all of the syringe service programs in Western North Carolina to assess what needs they had so that we could relay those to emergency management and get those supplies ordered for them. We also worked closely with different academic centers in that area to assess what gaps there were related to medication access.*

Access to laptops or phones with data connections, as well as language services, would have improved their ability to help individuals fill out paperwork to receive government benefits. Additionally, while the initial SSP supply flow was minimal, a later influx created a need for surplus management and careful distribution to avoid overwhelming local partners.

Managing Outside Normal Environmental Health Protocols

During the disaster response, the Environmental Health team found themselves operating outside their usual protocols. The need to respond quickly and think creatively was both a strength and a significant stressor. At times, staff felt they had to stretch their regulatory authority well beyond normal limits—something one veteran described as unprecedented in over two decades of public health work.

Likewise, reopening businesses under emergency operations plans proved both novel and stressful, especially without access to centralized water systems. Due to the political pressure to reopen quickly, businesses were sometimes reopened under murky safety standards. Additionally, the process of distributing disinfection materials directly to residents (“direct to consumer”) was a first-time effort and involved considerable logistical hurdles, including producing and distributing educational materials.

> *I think the biggest problem is, we had this vision of how these direct-to-consumer sites would serve people, but it's still at the mercy of the resident, whether or not they're going to take us up on the educational materials or even the supplies we provided. Some just wanted free buckets, and others wanted just the disinfection materials, but not everything else. So it was kind of hit or miss what was needed.*

Estimating and Accessing Environmental Health Supplies

Accustomed to smaller-scale operations, Environmental Health staff struggled with bulk ordering logistics and realized the need for a standardized internal catalog to guide future hurricane-season preparations. Slow resource delivery remained a critical weakness. Repeated delays in supplying essential items like disinfection kits forced some staff to bypass formal channels and rely on personal contacts to meet urgent needs, reflecting frustrations with a rigid and often unresponsive system. For Environmental Health, existing

databases used to estimate needed supplies were unreliable; one estimate, provided by Northeastern University, significantly overestimated the actual need. As a result, agencies spent considerable funds on supplies—many of which now sit unused.

> *One of our Achilles heels is our data. We have such poor databases. And the secretary's office was needing data. We were needing data. The division was needing data for things like getting water sample kits and disinfection kits and kind of knowing the full impact of the storm. And luckily we had Northeastern University up in Boston put some numbers together for us. And we used those numbers kind of as a basis to go off of for these supplies and kind of estimate the impacts. But now, after the fact, we've realized that those numbers were pretty heavily inflated.*

This was noted in LHD respondents as well, with a respondent noting that it "felt like the state was sending resources before checking with us as to what we really needed."

Accessing Prescription Drugs

Standard operating procedures also failed to address pharmacy-specific needs, leading to confusion during widespread drug shortages. The state's Strategic National Stockpile manager coordinated with the NC Board of Pharmacy to document pharmacy status, but the system was strained beyond its typical scope, which is more accustomed to working with select counties in Eastern North Carolina than the entire Western part of the state. Staff had to quickly adapt by using a local health director's license and securing an emergency exemption to allow shipping to a temporary location that didn't match the license address.

Legal constraints—such as challenges in filling prescriptions for medications for opioid use disorder—also further complicated the work of those involved in injury and violence prevention. Workarounds had to be found to get unfamiliar pharmacies to fill handwritten prescriptions for displaced clients.

Purchasing Supplies in the Field

On the budget and operations side, a recurring frustration was the lack of staff deployed with p-cards (purchasing cards). This omission created avoidable bottlenecks—teams setting up a temporary vital records office could not acquire basic supplies on-site and had to scramble to make purchases in Raleigh and arrange for transport. The experience emphasized the need for pre-established protocols and a clear, visual flowchart to outline emergency purchasing steps. Staff also reflected on the need for more insight into how emergency purchasing functions at the EOC, especially when setting up temporary services like the vital records office for the first time. There was widespread recognition that while better readiness is critical, maintaining it will require significant and sustained investment.

In one case, staff spent an entire night calling every store in Western North Carolina to track down supplies, only to hit a roadblock because no one on the ground had a purchasing card on hand, and many stores had shut down online ordering. In other cases, items were bought in Raleigh and transported west for use—this was especially so for the temporary vital records office.

I witnessed in my own unit, but what I witnessed in general, which was when we were trying to find these supplies, and me and my purchasing manager were having to call literally every store in Western North Carolina, when they did have stock in the beginning we were able to place orders online, using the division's credit card, but very quickly, like, after the first full, like maybe 24 to 30 hours, Walmart and Dick's sporting goods both shut down their ordering sites online, and said you had to be there in person to order it with a credit card. My National Guard person was there. They would not take a credit card over the phone. There was nobody in western North Carolina from emergency management or preparedness that had a purchase card on them, so we could not purchase them the supplies they needed.

The state public health lab was considered easier to work with than emergency management on certain supply and logistics matters.

Communication Breakdowns between Public Health and Emergency Management over Requests for Supplies

Communication breakdowns between public health and emergency management meant that critical needs—such as tetanus vaccines—were sometimes denied by default, given that they were not appreciated by EM leaders who prioritized non-public health resources. In many cases, informal workarounds, like staff from nonprofits submitting requests on behalf of LHDs, filled operational gaps that the formal system could not address.

And I think that communication between emergency management and public health at the State level. It was very glaring to me during COVID, but it was even more glaring to me during this, that that relationship is not there. You know that communication between public health and emergency management is poor. To really understand how they should filter meetings, and who they should talk to, to decide what needs to happen, and that integration of public health into emergency management.

Lack of Infrastructure to Communicate Supply Needs

Both supply and demand issues affected the response: there were not always enough people to deploy, and local departments sometimes lacked the bandwidth to receive or coordinate incoming support. A prolonged loss of power, infrastructure, and internet in many areas compounded these challenges and was not fully anticipated.

It felt like at a lot of points in the response, there was not only a supply issue with finding available staff, sometimes we had long rosters of staff, and there was a demand issue that we were having trouble getting the local health departments to be able to articulate their needs or feel that they had the capacity to accept the help that was available. There were, I think, problems on both sides of that equation...Even though we made recommendations to local health departments on assets that we could provide, I think this just hasn't been exercised. This type of loss of power and infrastructure and Internet connectivity for so long, I don't think was really

anticipated. And I think going forward, we need to exercise or lose some of these essential communication and networking functions for a long period of time.

State-deployed staff were often sent into uncertain and under-resourced conditions—sometimes with no fuel, no lodging, and no clear way to return. Transportation gaps made even basic deployment logistics challenging.

Limited Infrastructure for EHS Staff Identification and Deployment

On the environmental health side, Helene triggered more resource and personnel requests than ever before, revealing the lack of a scalable, well-organized system for deploying EHS staff. While PHP&R has strong deployment infrastructure for public health nurses, stakeholders emphasized the need to replicate that system for EHS staff.

I think the difference and the weakness that we had is that this – Helene brought more requests for resources, for environmental health specialists than we ever had, that I'm aware of. And so it showed us that we needed to build a more robust system in the process of deploying the teams and keeping up with the staff. So PHP&R is also responsible for deploying public health nurses as well, and they have a pretty robust system. And so we saw during Helene that we needed to mirror that system to help us run a more streamlined program.

Beyond logistics, there was a strong people-management component—supervisors were fielding calls from staff eager to help, asking why they had not yet been deployed, while also supporting the mental health of those already in the field. At times, this meant spending significant time on the phone simply being a compassionate listener to overwhelmed colleagues.

LHDs often circumvented slow state systems by sharing resources, especially EHS staff, among themselves, only to be reprimanded by state leadership. This not only demoralized willing helpers from outside the affected areas but also damaged trust in the state's leadership.

And along the lines with deployment, we heard from our local health departments, loud and clear, that our deployment system was too slow. Both for nurses and for registered environmental health specialists. And that health departments worked health department to health department. They became nimble and they became adaptable because things were needed – they needed things, and our system was too slow. Again, we weren't adapting to the need. So when folks were able to get back and we had county management, and we had our state leadership saying we've got to get businesses up and running, and that meant we needed EOPs, Emergency Operating Permits, and things for restaurants to get back open, that meant we needed to quickly get registered Environmental Health Specialists out because the ones that were in these counties couldn't do it by themselves, and some of them couldn't get out, right? And so our systems, again, like this plan is great, except that it has to be flexible, and it has to adapt. It has to be able to scale up and down, and it has to be able to like flex

with the event, and this time it didn't. And so we were too slow. And so health departments started working with each other to send especially Environmental Health Specialists to help, and then essentially got a slap on the hand and were told that's not how we do this. Hey – this is a catastrophic event. They needed help. They can get it from their partner a lot quicker than we were able to do it. Maybe that's actually a signal that we are failing them, not the other way, not them failing us, right? And so there's another, like, that's just resource management kind of stuff where it was like we're not adapting quick enough to this.

Within this context, disaster support personnel played a critical role in helping LHDs navigate the emergency response system. While LHDs were advised to submit requests through their local emergency managers into WebEOC, others frequently stepped in to assist when obstacles arose. They tracked requests manually—often using shared spreadsheets and text messages—and advised LHDs to follow up if there was no movement within 48 hours. Many of the tools they used, including a best contact list and tracking spreadsheets, were developed on the fly.

We would tell health departments, 'Hey, do try to get it through your local emergency manager because it's going to go into WebEOC.' … So we weren't tasked with the resource management tracking pieces as much as when health departments could not get it through, or found obstacles in getting the things they need, or were not prioritized at the local level, we were the way that they could get a request in. Once the request was in our job of … tracking and like, has the request been satisfied … that part we would do.

Beyond these informal networks, formal efforts to survey and pre-identify deployable EHS staff also fell short—some employees were approved on paper but blocked by supervisors due to inexperience. However, individuals did their best to match staff expertise to specific needs—like food safety inspections or well assessments.

Personnel Management within Sheltering Model

The sheltering model also drew criticism, particularly the requirement for nurses to be physically present despite workforce shortages. Participants called for more flexibility—such as enabling remote oversight—to ease the burden.

I think we need better collaboration and thinking creatively around this issue, involving Departments of Social Services, involving public health, involving emergency management to think about what these shelters need to look like from a personnel standpoint: who needs to be on site, what support is provided, sort of oversight remotely to- to kind of alleviate some of these people struggles- like human resource, struggles.

Uneven Coordination through EMAC

Coordination through EMAC was uneven. While EMAC is intended to streamline out-of-state nurse deployments, some arrived unexpectedly and with no prior notice. Internal

communication gaps also left public health staff unaware of available base camps for these workers. Resource requests were also more specialized than usual, and the logistics teams were not familiar with some items, which caused delays.

> *So on the nursing side, one of the things we often do, because we typically have a shortage of nurse support, is EMAC requests to bring in nurses from other states. I do think there were some – we have a template sort of preloaded to be able to initiate that request when needed. And we used that template this time. But there were some issues, I think, that stemmed overall with that process. There was, I think, logistics overall was really overwhelmed. So there were some communication gaps back and forth between logistics and us about the status of our request, and we actually had some EMAC teams of nurses show up before we even knew that they were coming to us. And we were able to work it out, but I think that is something that happened that we could have improved upon is just a way to kind of keep a clear pulse on those EMAC requests and the statuses of them, and making sure that as they're approved or accepted, we get a clear point of contact to work with to kind of track those things through.*

PHP&R expressed the need for more direct and streamlined contact with EMAC representatives to bypass inefficient middle layers. There was also a clear call to develop a backup team for medical countermeasure deployment—particularly for situations where nurses are both providing care and coordinating medication distribution.

Limited Ability to Allocate Resources

A large challenge during activation was the ability to reallocate resources. Federal funding is contracted to "very specific things" and those resources cannot be repositioned, even in an emergency.

More notice that an activation was coming would have allowed PHP&R staff to prepare a greater commitment to the disaster relief effort, such as allowing them to start any necessary vendor approval processes or to identify where those are lacking. Staff were unable to acquire the necessary materials for mobile vaccinations as there was no specific procurement process in place, and the contracting systems had not been mobilized. Unlike during the ongoing COVID-19 response, for this short-term disaster there was "no pre-approved vendor to do that work and we couldn't have procured it fast enough [before] the need was basically gone", highlighting the need for both pre-approved contracts and better planning for no-notice or limited notice events.

Summary Findings and Recommendations

Resource management significantly varied before and after internet connection was secured.

Informal tools (e.g., calls, texts) and networks of support, such as peer contacts, were important prior to re-establishment of internet. Formal platforms (e.g., WebEOC) were slow and/or personnel completing resource requests (e.g., emergency managers) were

unavailable. There was a reliance on centralized digital systems without sufficient contingency planning for decentralized resource management. Before internet access was secured, personnel depended on informal tools—calls, texts, and peer networks—which, despite their lack of formality, offered immediacy, flexibility, and direct access to key contacts. Once available, formal platforms like WebEOC were slow due to being overloaded, and required hierarchical approval structures and/or inefficient user interfaces, delaying response times. Absence or unavailability of designated emergency managers compounded the challenge, stalling resource requests, producing bottlenecks, and/or unclear delegation of authority.

Recommendations

- Develop flexible internal mechanisms to purchase supplies (e.g., a standardized catalog of purchasable supplies) during periods where formal systems are unavailable.

- Establish temporary vendor-approval protocols during pre-disaster planning for urgent resource requests during emergencies (akin to pre-approvals during COVID), including clear visual flowchart to outline emergency purchasing steps and on-the-ground personnel with access to p-cards to make such purchases.

- Create modular resource assessment and procurement components that allow adjustments based on the specific crisis type (e.g., public health emergencies vs. natural disasters).

- Establish regional staging areas for deployed EHS and PHN staff to provide centralized coordination where responders can receive briefings, adjust plans based on updated field conditions, and optimize distribution routes before moving into impacted areas. These hubs would facilitate real-time adjustments, ensure better oversight on supply flow, personnel movement, and adaptable response strategies.

The western part of the state was less prepared to respond to a hurricane than the east, resulting in resource gaps. Eastern personnel stepped in, helping to provide critical response.

There are significant variations in the regional perception of hurricane risk and historical exposure differences. The eastern part of the state, repeatedly hit by hurricanes, has built strong preparedness infrastructure, response protocols, and trained personnel. This readiness became a standard part of emergency management in the region. In contrast, the western region, historically less affected, has allocated fewer resources, resulting in gaps in planning, supplies, and trained responders. This disparity highlights regional differences in perceived risk of some emergencies and corresponding investment in preparedness.

Recommendations

- Develop and conduct planning exercises that include regional attendees (e.g., from the eastern and western parts of the state) to prepare for cross-regional response, address potential resource gaps, and develop cross-regional protocols.

- Develop protocols to identify, recruit, and integrate personnel from unaffected parts of the state to support affected regions.

- Evaluate existing preparedness and response plans to verify that planning assumptions are grounded in reality, account for changing disaster behavior, adequately identify regional gaps.

The system for estimating and fulfilling environmental health resources was inadequate and led to oversupply and no solution for redistribution.

There was an absence of dynamic demand-assessment tools and structured redistribution pathways for surplus resources. A lack of accurate data led to inflated estimates for well disinfection kits, resulting in excess supply. The inaccuracy in estimating environmental health resources suggests that models relied on static assumptions, past data, or generalized estimations rather than real-time analysis.

Recommendations

- Develop/refine process for collecting and assessing data in impacted areas to inform supply purchases (e.g., water sample kits, disinfection kits).
- Develop and incorporate system for redistributing or storing non-perishable surplus supplies as part of resource management demobilization process.

IV. Conclusion

The unprecedented impacts of Tropical System Helene resulted in substantial stress on the public health response by NCDPH. These impacts resulted in unanticipated failures of critical systems and infrastructure to support a coordinated response. Despite these infrastructure failures, strengths of the NCDPH response affirmed that public health can overcome operational challenges and leverage partnerships, networks, and creative solutions to respond to public health emergencies and natural disasters. The primary strengths identified in this review are:

1) **Public health personnel support from across North Carolina:** the deployment of PHN and EHS staff was an example of how public health responders can leverage their specific experience and expertise, particularly to supplement skill and experience gaps in local public health response;

2) **Engagement of informal networks and communication channels to address immediate needs of local agencies**: while some examples included operating outside the typical chain of command or SOGs, public health responders demonstrated adaptability to the conditions and leveraged connections with partners to provide mostly sufficient work-arounds to communications challenges;

3) **Creative solutions and problem solving to establish and maintain communication despite infrastructure challenges**: similarly, public health responders utilized new technologies for communicating with partners, while also embracing the need for traditional communications when available. It should also be noted that internal communications and partnerships across NCDPH branches and responders was a strength.

The challenges identified in this review, however, identify numerous instances where improvements in public health response and in the supportive systems and structures are essential. Some of the most critical feedback was received by partners within the SEOC, who were dependent on partnership with NCDPH for a coordinated response for ESF-8 functions. The most notable challenges were emblematic of systemic changes that are necessary to improve the public health response:

1) **The public health response was inflexible and slow to adapt early in the response, highlighting the lack of a response mindset within the agency:** this led to delayed decision-making and lack of role clarity during the response, and was specifically cited as how public health responders in the SEOC did not operate with an "emergency response mindset;"

2) **The public health response involved DPH branches and staff that lack experience in emergency response**: this is emblematic of the larger public health workforce that experiences high turnover and struggles with recruitment and retention, but led to inconsistencies, delays and inefficiencies in the Helene response;

3) **Delays in decision-making and inconsistencies led to operating outside standard operating guidance and established chains of command**: this is likely a result of the above two challenges but caused operational inefficiency and undermined the public health staff serving in the SEOC – which, as identified in the review, was necessary at times to make decisions and solve problems.

From a planning perspective, Helene was an example of how intensifying natural disasters are increasingly impacting areas that have not historically experienced such events. The

lessons learned from Helene are an opportunity to broaden the scope of preparedness planning to consider low-probability scenarios in areas across North Carolina and build resiliency across the state. One of the primary strengths identified in this review is the engagement of partnerships and networks demonstrated through the deployment of public health responders from across the state, particularly those in eastern North Carolina with experience responding to hurricanes. Future planning efforts should look to build upon the engagement and activation of the network of public health responders and design adaptable and scalable response systems that leverage the existing expertise and experience of public health responders outside of directly impacted areas.

Overall, the challenges identify significant issues in coordination, and it is imperative to address these issues to strengthen the public health response and preparedness for the next public health emergency or natural disaster. The recommendations provided in this review identify opportunities to immediately address needs and other opportunities for long-term system strengthening. As evidenced by certain successes, the lessons learned from the Helene response can build upon strengths, continue addressing challenges, and strengthen partnerships across responder agencies to improve the public health response in North Carolina. As stated by one external partner,

> *I want to see them succeed. I want to see them be a strong partner who is in the fight with us because they bring a lot to the table. The role of public health is incredibly important … I truly feel strongly that if they get good feedback and are willing to take action on it, then they could be that partner that we all want to see, and we want to help them get to that point.*

V. Appendices

Appendix A – Survey Instrument

Appendix B – Focus Group Guide

Appendix C – Acronyms

A. Appendix A – Survey Instrument

Tropical Storm Helene After-Action Survey

The purpose of this survey is to gain a more thorough understanding of the agency-level impacts of Tropical Storm Helene (Helene) in the fall of 2024. The information you provide in this survey will inform recommendations and lead to operational improvements in the Division of Public Health's response to future public health emergencies.

The North Carolina Institute for Public Health (NCIPH) is partnering with the Division of Public Health (DPH) to conduct this survey as part of a larger information gathering effort to conduct a broad after- action review of public health operations at the local and state level.

Your answers to this 10- to 15-minute survey will support the findings and recommendations in the after- action review. **Your responses will be kept confidential and will only be reported in aggregate based on your agency as either directly impacted or supporting agencies.** Directly impacted areas are those agencies serving the 39 counties that received a federal major disaster declaration, while supporting agencies are defined as those agencies who deployed staff or other capacity in support of the public health response to Helene.

This AAR initiative has been determined to be not human subjects research by the University of North Carolina at Chapel Hill Institutional Review Board (UNC IRB study #25-0349). If you have questions or concerns, please reach out to the UNC IRB at irb_questions@unc.edu or 919-966-3113, or you can contact the project investigator, Dr. John Wallace, at nciph@unc.edu.

Your participation in this survey is voluntary and all the opinions you share with us will be completely confidential and will be reported only as a group summary. Only questions for characterizing your agency and type of response are required; you may decline to answer any other question by selecting "Prefer not to say," and you may end this survey at any time.

Do you wish to participate in this survey?

- ○ Yes
- ○ No

Agency and Roles.

This section will help identify your local health department and the role(s) at your agency and during Helene. Your answers in this section will determine the subsequent survey sections to which you will be asked to respond.

Please select the local health department or health district where you work.

Note: Please scroll for the full list of health department options

If you work in multiple counties, please specify here.

What is your supervisory status?

- ○ Non-supervisor: you do not supervise other employees
- ○ Supervisor: you are responsible for employees' performance appraisals and approval of their leave, but you do not supervise other supervisors
- ○ Manager/Management Team: you are in a management position and supervise one or more supervisors
- ○ Prefer not to say

Which of the following is most like or best describes your current position/job title?

Note: Please scroll for the full list of positions/job title options.

How would you describe your role in the response activities to Helene? *Select all that apply*

- ☐ My agency was activated and responded to Helene response activities
- ☐ I was deployed by my agency to support another health department or Helene response activities ☐ At least one of my staff deployed to support another health department or Helene response activities
- ☐ My agency provided other supportive capacity (please specify)
- ☐ My agency did not support any Helene response activities
- ☐ Prefer not to say

Deployed Staff.

Thinking specifically about your deployment, please answer the following questions to the best of your ability.

What worked well in your deployment process?

What aspects of your deployment could be improved?

What information do you wish you would have had when (or before) you deployed?

How likely are you to deploy again, if needed?

- ◯ Very likely
- ◯ Somewhat likely
- ◯ Neutral
- ◯ Somewhat unlikely
- ◯ Very unlikely
- ◯ Prefer not to say

Supporting Counties.

This section is specific to agencies that supported Helene response operations. These questions are designed to assess various agency operations related to response and recovery.

How were you or your staff requested?

- ◯ Request through existing mutual aid agreements
- ◯ State request through PHP&R or EM
- ◯ Other (please specify) _____
- ◯ Prefer not to say

What Helene response activities did your agency support?

Select all that apply

- ☐ Nurse deployment to staff emergency shelters
- ☐ Environmental health staff deployment to support operations
- ☐ Laboratory capacity (supporting well water testing)
- ☐ Other (please specify) _____
- ☐ Prefer not to say

What Helene response activities did you support?

- ◯ Nurse deployment to staff emergency shelters
- ◯ Environmental health staff deployment to support operations
- ◯ Laboratory capacity (supporting well water testing)

- ○ _____ Other (please specify)
- ○ Prefer not to say

Question for All Health Departments

The following questions are for all local health departments as they relate to NCDPH's activities the Helene response and recovery.

How did your agency coordinate with NCDPH during activation?

Select all that apply

- ☐ Regular meetings or briefings
- ☐ Shared communication platforms (e.g., email, WebEOC) ☐
- Joint training or pre-existing agreements
- ☐ Ad hoc coordination as needed
- ☐ _____ Other (please specify)
- ☐ My unit did not coordinate with NCDPH
- ☐ Prefer not to say

What challenges did your agency encounter in coordinating with NCDPH during activation?

Select all that apply

- ☐ Communication barriers
- ☐ Lack of clarity in roles/responsibilities ☐
- Insufficient staffing or resources
- ☐ Delayed decision-making
- ☐ Conflicting priorities with other agencies
- ☐ _____ Other (please specify)
- ☐ No challenges encountered
- ☐ Prefer not to say

What were some overall strengths regarding NCDPH's role in activation?

Select all that apply

- ☐ Clear communication and coordination ☐
- Well-defined procedures
- ☐ Adequate staffing and resources
- ☐ Strong leadership and decision-making
- ☐ Effective training and preparation
- ☐ Other (please specify)
- ☐ No challenges encountered
- ☐ Prefer not to say

Where are there opportunities for improvement in NCDPH's activation and demobilization process?

Select all that apply

- ☐ Improved communication and coordination
- ☐ Clearer roles and responsibilities
- ☐ Better training and preparedness
- ☐ More efficient resource allocation
- ☐ Faster response time
- ☐ _____ Other (please specify)
- ☐ Prefer not to say

Which communication methods were <u>most</u> effective and <u>least</u> effective in coordinating Helene response efforts?

Select all that apply, and explain your responses in the space provided, as needed.

	Most	Least	Please explain your selection in the space provided below
Daily briefings	☐	☐	
Situation reports	☐	☐	
Email	☐	☐	
	☐	☐	
Phone calls Text	☐	☐	
messages	☐	☐	
WebEOC VIPER	☐	☐	
Radios	☐	☐	
	☐	☐	
Microsoft Teams Calls			
	☐	☐	
Prefer not to say	☐	☐	

Once established, how effective were communication systems in ensuring timely information sharing?

- ○ Very effective
- ○ Somewhat effective
- ○ Neutral
- ○ Somewhat ineffective
- ○ Very ineffective
- ○ Prefer not to say

To what extent do you agree with the following statements? *Please explain your rating in the space provided below.*

	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Please explain your rating in the space provided below
There was a clear chain of communication established during the Helene response for my role	○	○	○	○	○	
My agency received timely resource support	○	○	○	○	○	
My agency had adequate staffing support	○	○	○	○	○	
There was strong coordination between supporting agencies	○	○	○	○	○	
Entities and leadership had a common operating picture for the response	○	○	○	○	○	

How would you rate NCDPH's ability to perform the capabilities below during the Helene response?

	Performed without challenges	Performed with some challenges	Performed with major challenges	Unable to perform	Prefer not to say	Please explain your rating in the space provided below
Emergency Operations Center Staffing	○	○	○	○	○	
Public Health Coordination Center Staffing	○	○	○	○	○	
Public Health Call Center Coordination and Staffing	○	○	○	○	○	
Public Health Information/ Joint Information Center	○	○	○	○	○	
Public Health Nurse Medical Surge (Shelter - Nurses)	○	○	○	○	○	
Environmental Health Specialist Surge	○	○	○	○	○	
Vaccine Coordination and Distribution or Coordination with Immunization Branch	○	○	○	○	○	
Public Health Laboratory Testing or Coordination with State Lab	○	○	○	○	○	
Fatality Management	○	○	○	○	○	
Vector Control	○	○	○	○	○	
Public Health Surveillance & Epidemiology Investigation or- Coordination with Communicable Disease	○	○	○	○	○	
Distribution and GIS Mapping of CMS Data	○	○	○	○	○	
Demobilization Operations	○	○	○	○	○	

Impacted Counties.

This section is specific to agencies in counties that received a major disaster declaration. These questions are designed to assess various agency operations related to response and recovery.

What support did you receive from NC Division of Public Health during the Helene response?

Select all that apply

- ☐ Emergency Operations Center Staffing
- ☐ Public Health Coordination Center Staffing
- ☐ Public Health Call Center Coordination and Staffing
- ☐ Public Health Information/Joint Information Center ☐
- Public Health Nurse Medical Surge (Shelter -Nurses) ☐
- Environmental Health Specialist Surge
- ☐ Vaccine Coordination and Distribution or Coordination with Immunization Branch ☐
- Public Health Laboratory Testing or Coordination with State Lab
- ☐ Fatality Management
- ☐ Vector Control
- ☐ Public Health Surveillance & Epidemiology Investigation or- Coordination with Communicable Disease ☐
- Distribution and GIS Mapping of CMS Data
- ☐ Demobilization Operations
- ☐ _____ Other (specify)
- ☐ Prefer not to say

What criteria or triggers did your agency use to activate emergency response operations for Helene?

Select all that apply

- ☐ Predefined thresholds (e.g., storm category, geographic impact) ☐
- Direct request from higher authorities
- ☐ Coordination with external agencies
- ☐ _____ Other (please specify)
- ☐ Prefer not to say

How would you rate the NCDPH PHP&R response on the following incident objectives during the Helene response?

	Incident Objective Rating						Rationale for Rating
	Excellent	Good	Fair	Poor	Don't know/ not applicable	Prefer not to Say	Please explain your rating in the space provided below
Maintain continuity of operations across DPH functions	○	○	○	○	○	○	
Respond to resource requests as power/ communications are restored	○	○	○	○	○	○	
Address resource requests within 15 minutes	○	○	○	○	○	○	
Ensure timely and accurate communications	○	○	○	○	○	○	
Conduct Local Health Department assessments to coordinate restoration and/or continuation of public health essential services	○	○	○	○	○	○	
Deploy public health nurses and environmental health specialists	○	○	○	○	○	○	
Transport vaccines to fulfill vaccine requests	○	○	○	○	○	○	
Coordinate fatality management support	○	○	○	○	○	○	
Transport newborn screening specimens or other critical specimens to SLPH	○	○	○	○	○	○	

How would you rate the NCDPH PHP&R response on the following incident objectives during the Helene response?

	Incident Objective Rating						Rationale for Rating
	Excellent	Good	Fair	Poor	Don't know/ not applicable	Prefer not to Say	Please explain your rating in the space provided below
Operate with life safety as first priority	○	○	○	○	○	○	
Develop and issue messaging for childcare centers on reopening safely.	○	○	○	○	○	○	
Ensure communicable disease surveillance in shelters	○	○	○	○	○	○	
Coordinate pharmacy, medication and select wound care supplies for distribution	○	○	○	○	○	○	
Plan for and distribute well water testing kits and disinfection information, collect samples from residents, conduct analysis, and report back to submitter	○	○	○	○	○	○	
Refine Environmental Health strategy to mitigate impacts from water and sewage infrastructure damage	○	○	○	○	○	○	
Develop and issue emergency operations plan template for restaurants to use when facing extended water emergencies.	○	○	○	○	○	○	
Develop and issue environmental health guidance and messaging (i.e. exposure prevention, safe building reentry, precautions for safely turning water back on, etc.).	○	○	○	○	○	○	
Adjust organization to address recovery phase	○	○	○	○	○	○	

Please describe any additional strengths or potential best practices in the NCDPH response and recovery operations.

Please describe any additional weaknesses or opportunities for improvement in the NCDPH response and recovery operations.

Survey End.

If you would like to have a follow-up conversation about any of the topics addressed in this survey, please enter your name and contact information below.

If there is any additional information related to the Hurricane Helene response that you would like to include, please do so now.

Would you like to be entered into a drawing to receive one of 20 $250 gift cards?

Note: Selecting "Yes" will take you to a separate survey to enter your identifying information. The information you provide will not be stored with your responses to this survey.

B. Appendix B – Focus Group Guide

Introduction & Informed Consent

My name is **[name]**, and this is my colleague **[name]**. We are research staff associated with the UNC Gillings School of Global Public Health.

Our team has been recruited by leadership at NCDPH to conduct an After-Action Review of public health's response to Tropical Storm Helene (hereafter, "Helene").

[You or your unit] have been identified as someone who was responsible for, or significantly involved in, decision making or coordination within DPH regarding the response to Helene.

This interview will last about an hour, depending on how the discussion goes. You may stop the interview at any time. We will be recording the interview; it will be transcribed for data analysis. If you prefer for this interview not to be recorded and transcribed, please let us know now.

Findings from this project will be utilized to develop written reports, including memos and manuscripts, and other products and future activities about local public health decision making during the response to Helene. We will not include your name or organization without your explicit written consent. Interview data that has been de-identified will not be used for any other purpose without first obtaining your permission to do so. Your name, organization or contact information will not be associated with any data that is shared in such a repository.

Dr. John Wallace at the North Carolina Institute for Public Health is the principal investigator for this review. If you have any questions or concerns about this review and your rights as a participant, you can contact the UNC Institutional Review Board at irb_questions@unc.edu or 919-966-3113. UNC's IRB has determined that this activity does not constitute human subjects research and is therefore exempt from review.

Do you have any questions for me before we begin?

I am now going to turn on the recording and ask if you consent to participate and be recorded.

Do you consent to participate? Yes

Do you consent to this interview being recorded? Yes

Ground rules [if a focus group]

- The most important rule is that only one person speaks at a time. There may be a temptation to jump in when someone is talking but please wait until they have finished. And remember that we are recording, so to make sure your input is clear, it's best to only have one person speak at a time.
- There are no right or wrong answers.
- You do not have to speak in any particular order. My role as moderator is to guide the discussion. Talk to each other.

- When you do have something to say, please do so. There are several of you in the group and it is important that I obtain views from each of you.
- You do not have to agree with the views of other people in the group, but we ask that you listen respectfully as others share their views.
- Please turn off your cell phones. If you cannot turn it off and you must take a call, please do so as quietly as possible and rejoin us as quickly as you can.
- Does anyone have any questions? (provide answers)
- OK, let's begin

Warm up questions

First, I'd like everyone to introduce themselves. Can you tell us your first name only, no last names and your primary responsibilities in your role at **[your unit]**, particularly as they pertain to the Helene response?

Interview Questions

The rest of this interview will explore five facets of the Helene response efforts: activation, communications, resource management, coordination, and demobilization.

General

With regard to the Helene response, can you describe either generally or within one of the categories I mentioned what worked and/or what didn't work? **[Note: this discussion will likely take 20-30 minutes. If not, begin with the items below as probes]**.

[You can also transition to a specific category below after the general discussion by saying, "we've heard from you on [area(s), e.g., communication, etc.], I'd like to transition to [name area, e.g., coordination]." Then use one of the main questions below to get the conversation started under that category.

Part 1: Activation

Main questions:

- What were some overall strengths regarding your unit's role in activation and demobilization?
- Where are there opportunities for improvement?
- With regards to activation, would you say your unit was able to perform this activity without challenges, some challenges, major challenges, or were unable to perform? Explain your answer.

Probing questions (as needed):

- What specific criteria or triggers did your division use to activate emergency response operations for Helene?
- How did your unit coordinate with local health departments and emergency management agencies during activation, and what challenges did you encounter in ensuring a smooth response?
- Were there any planning or other documents that were intended to help you prepare for your role in this response? Were they effective? Why or why not?

Part 2: Communications

Main questions:

- What were some overall strengths regarding your unit's role in communications?
- Where are there opportunities for improvement?
- With regards to communications, would you say your unit was able to perform this activity without challenges, some challenges, major challenges, or were unable to perform? Explain your answer.

Probing questions (as needed):

- How did your division ensure clear and timely internal communication as well as external communication to emergency management and other partners during Helene?
- What methods of communication were implemented within DPH to ensure everyone involved in the response had a common operating picture? Were they effective?
- What strategies or tools did your division use to effectively communicate public health information to the public, especially vulnerable populations, during the Helene disaster?
- How did you coordinate messaging with external agencies (e.g., local health departments, hospitals, and federal partners) to ensure consistency and avoid misinformation?
- What communication challenges did your division encounter during Helene, and what improvements have been made to address them?
- What communication tools or structures utilized during the Helene response would you like to see formalized in future emergency response?

Part 3: Resource Management

Main questions:

- What were some overall strengths regarding your unit's role in resource management?
- Where are there opportunities for improvement?

- With regards to resource management, would you say your unit was able to perform this activity without challenges, some challenges, major challenges, or were unable to perform? Explain your answer.

Probing questions (as needed):

- How did your division assess resource needs before, during, and after Helene to ensure an effective response?
- What strategies did you use to allocate and distribute limited public health resources equitably across affected communities during Helene?
- How did your division coordinate with external partners (e.g., FEMA, non-profit organizations) to supplement state resources and address shortages?
- What systems or processes did you have in place to track resource availability and deployment in real time, and how do you address shortages or logistical challenges?

Part 4: Coordination

Main questions:

- What were some overall strengths regarding your unit's role in coordination?
- Where are there opportunities for improvement?
- With regards to coordination, would you say your unit was able to perform this activity without challenges, some challenges, major challenges, or were unable to perform? Explain your answer.

Probing questions (as needed):

- How did your division coordinate with local health departments, emergency management agencies, and others to ensure an effective public health response during Helene?
- How did your division coordinate with others within DPH?
- What mechanisms did you have in place to facilitate real-time information sharing and decision-making among state, local, and federal partners during Helene?
- How did your division engage with non-governmental organizations, community-based groups, and private sector partners to enhance coordination and resource distribution?

Part 5: Demobilization

Main questions:

- What were some overall strengths regarding your unit's role in demobilization?
- Where are there opportunities for improvement?

- With regards to demobilization, would you say your unit was able to perform this activity without challenges, some challenges, major challenges, or were unable to perform? Explain your answer.

Probing questions (as needed):

- What protocols and benchmarks guided the demobilization process, and how did your team ensure a transition back to normal operations while addressing ongoing public health needs?
- Following demobilization, what after-action assessments or improvements did your division implement to enhance future hurricane response efforts?

Were there any other major challenges, successes, or best practices that you experienced that we haven't addressed within the categories we've already covered?

Is there anything else you'd like to tell us? Thanks all participants.

When we complete all the Focus Groups, our team will code and analyze the information you have provided. We will provide our report to the DPH leadership who will communicate the core findings of our report with local and state public health members.

C. Appendix C – Acronyms

Acronym	Definition
AAR	After-Action Review
CDC	Centers for Disease Control and Prevention
EHS	Environmental Health Specialist
EMAC	Emergency Management Assistance Compact
EOC	Emergency Operations Center
EOP	Emergency Operating Permit
ESF	Emergency Support Function
FEMA	Federal Emergency Management Agency
JIC	Joint Information Center
LHD	Local Health Department
NCDEQ	North Carolina Department of Environmental Quality
NCDHHS	North Carolina Department of Health and Human Services
NCDPH	North Carolina Division of Public Health
NCEM	North Carolina Emergency Management
PACE	Primary – Alternate – Contingency - Emergency
PHP&R	Public Health Preparedness and Response (Branch of NCDPH)
PHN	Public Health Nurse
PIO	Public Information Officer
SEOC	State Emergency Operations Center
SOG	Standard Operating Guidance
SSP	Syringe Service Program
VIPER	Voice Interoperability Plan for Emergency Responders
WebEOC	Web Emergency Operations Center (software developed and sold through Juvare used for resource requests and information sharing)