



**Pee Dee Healthcare Coalition  
Hazard Vulnerability Analysis  
(HVA)**

**November 2023**

## Background

Each year the Pee Dee Healthcare Coalition (HCC) solicits input from each of its member entities to form a Hazards Vulnerability Analysis (or HVA) to better inform strategic decisions regarding planning, training, resourcing, and exercising efforts of the HCC.

The Pee Dee Healthcare Coalition consists of members from the following counties in NE South Carolina: Chesterfield, Clarendon, Darlington, Dillon, Florence, Georgetown, Horry, Lee, Marion, Marlboro, Sumter, and Williamsburg Counties and has an estimated population around 937,826 according to adjusted 2023 US Census data<sup>1</sup>.

In the past vendors have been utilized to collect information from HCC members and develop a HVA for the HCC. Since 2018, the HCC has taken it upon itself to collect information in a variety of ways and develop an HVA on its own. This has ranged from large group format collection to member entity surveys. The number of hazards has varied from a dozen or so up to over 30. The basic format for evaluation of the HCC's risk (or relative threat) has followed best practices established and used in other HCCs around the US.

Most recent HVAs have relied on the popular healthcare based HVA developed by Kaiser-Permanente<sup>2</sup> and have included the collection of information on the number of HCC members alerts and activations for each hazard as well. Responses for collection of data in the past were primarily submitted by hospital partners followed by emergency management, public health, and nursing homes.

## Methods

For HPP Grant Budget Period 5 (FY24), the HCC developed a list of 20 hazards using a survey process to collect information on the 20 hazards identified most applicable to our area. To reduce the number of hazards and the time it takes to complete the survey of its members' facilities, the Pee Dee HCC decided to arrange and group some similar hazards under a single hazard. A good example of this would be our group of snow, sleet, ice storms, and similar winter weather hazards under a single hazard of Winter Weather.

The survey contained within was collected using Pee Dee Region Department of Health and Environmental Control's Ready Op account. Ready Op<sup>3</sup> is primarily a communications software that allows for large volume pushing of information but also for collection and management of information. In Ready Op a 'Form' was created to layout the information to be collected as well

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<sup>1</sup> <https://data.census.gov/>

<sup>2</sup> <https://www.calhospitalprepare.org/hazard-vulnerability-analysis>

<sup>3</sup> <https://www.readyop.com/>

as its format/layout. Once the data was collected, it was extracted via Excel spreadsheet and copied into another spreadsheet set up with formulas to act as an aggregator for all the data. This report is presented using this data and collection method.

For BP5 (FY24), the survey was sent to 239 individual HCC members with 22 respondents covering 26 campuses across the region. Most responses were from Hospitals (8 campuses) and Kidney/Dialysis/ESRDN centers (8). Also contributing were members representing Nursing Homes (Skilled/LTC), Outpatient Care (non-FQHC), Emergency Management, NGO, EMS/Fire Rescue, and Public Health.

The hazards identified for evaluation in this HVA include the following:

1. Thunderstorms – This includes lightning, thunderstorms, hail, excessive rain, and non-hurricane related high wind events.
2. Winter Weather – This includes snow & ice accumulation and freezing rain events.
3. Hurricane – This includes all hurricane-associated hazards such as coastal and riverine flooding, severe weather (lightning, hail, wind) and tornados that are directly caused by the hurricane itself.
4. Tornado – This is for all tornados not associated with hurricane events.
5. Flooding – This covers all internal or external flooding that is not associated with hurricane events.
6. Fire – This is for internal structure fire or wildfire events.
7. Earthquake – This covers events with the fault zones in or near our region. The PeeDee has 2 events listed in state-planning scenarios which could most be affected by this hazard.
8. Attack / Violence – This is an external attack or act of violence and would include but is not limited to active shooter events.
9. Hostage / Child Abduction – This covers the events listed in the category name.
10. Terrorism – This includes both domestic and international acts of terrorism but does not include cyber attacks covered under its own category.
11. Bomb Threat / Suspicious Package – This covers the events listed in the category name.
12. Workplace Violence / Threat – This covers the events listed in the category name and could be from current staffing, post staffing, or outside actors.
13. Cyberattack – This covers the events listed in the category name.
14. Utilities Loss – This covers loss of electrical, water, sewer, IT or HVAC services.
15. Supply Chain Disruption – This includes issues that would hinder the continuity of care and/or daily activities. Disruption in supply production or the transportation/distribution of supplies are included as well.
16. Staffing Emergency – This is for events that cause staffing to fall short and compromises normal daily operations or continuity of care and may include labor strikes, walkouts, or other events that disrupt normal staffing from being present.

17. Chemical / Radiation – This includes events where a hazardous chemical or radiation source has been released within a local or larger vicinity and the release has potential for harming people.
18. Mass Casualty Incident (MCI) – This covers any event that causes an excess of injuries or fatalities that exceeds the normal resources of a facility or area.
19. Disease, Endemic – This is infectious disease outbreaks normally occurring in the region, seasonal influenza, TB, or similar outbreaks.
20. Disease, Novel – This covers disease outbreaks stemming from diseases not endemic to our region and may include pandemic viruses, Ebola, monkeypox, or others of zoonotic nature.

The following definitions were used to define categories used to define the hazards into a scoring scale:

Risk	Category	Defined		Score	Scoring Scale
Risk	Relative Risk	The probability of an event occurring and the impact it will have on the region, based on current mitigation capabilities of the region. Relative Risk = Probability X Severity (Impact + Response).		0	No Risk incurred
				1-25%	Low Risk
				25.1-50%	Moderate Risk
				50.1-75%	High Risk
				75.1-100%	Highest Risk
Alerts	# of Actual Alerts	The # of times an alert for a potential risk was issued that increased awareness that may have led readiness for an activation		#	Number of times on alert between July 1st, 2022, and current date.
Activations	# of Actual Activations	The # of times an actual activation (partial or full) was issued within your facility for a potential hazard.		#	Number of times activated between July 1st, 2022, and current date.
Probability	Probability	Historical review of the last 10 years and the likelihood that the event will occur within the next 10 years		0	No Probability/Not Applicable
				1	Unlikely to occur, but possible in next 10 years.
				2	Likely to occur at least once in the next 10 years.
				3	Very likely to occur and possibly several times in the next 10 years.
Severity	Impact	Human Impact	Based on the # of victims and the acuity of injury or potential for death within	0	No Injuries/Not Applicable
				1	Low acuity/low volume of injuries
				2	Increasing acuity/volume of injuries
				3	High acuity/volume of injuries as well as deaths

			the region cause by an incident.			
		Property Impact	Extent of damage or loss of infrastructure that could limit or severely impact access to and delivery of medical care within the region. Financial impact to resume normal operations.	0	No Probability/Not Applicable	
				1	Minor damage, recovery in less than 2 weeks	
				2	Moderate damage, recovery 1-6 months	
				3	Major to Severe damage, recovery 1 year +	
		Business Impact	Loss resulting from service interruption or termination of services brought on by an event within the region.	0	No Probability/Not Applicable	
				1	Non-essential service disruptions	
				2	Essential service disruptions/interruptions	
				3	Termination of both essential and non-essential services	
		Mitigation	Preparedness	Plans, policies, and procedures implemented within the region and can be relied upon for use during incident response.	0	No Probability/Not Applicable
					1	No or few plans in place/Some training developed for a regional response.
					2	Updates for plans needed and most staff trained for a regional response.
	3				Plans in place and integrated with up-to-date training for regional response.	
	Internal Response		The ability of the facility to coordinated resources in the event an incident occurs.	0	No Probability/Not Applicable	
				1	Limited resources in most categories, mustering of additional staff NOT viable.	
				2	Limited resources in some categories, mustering of additional staff viable.	
				3	Resources readily available.	
	External Response	External resources available to the HCC to	0	No Probability/Not Applicable		
			1	Limited resources available within the region, extended time for deployment.		

			aid in incident response and recovery operations.	2	Many resources available within the region, some time to mobilize required.
				3	Resources readily available within the region and processes in place to access.

Respondents were asked to provide some basic information to establish which member facility was reporting the information, list their facility type <sup>4</sup>(based on HCC membership types), and to identify a point of contact for the member in the event there were any questions or issues with their submission.

As defined in the table above, the Risk was determined using the following formula:

$$\text{Relative Risk} = \text{Probability} \times \text{Severity (Impact + Response)}$$

The formula results are listed as percentages in the results section. The number of alerts and activations were used to contrast the events for the period covered as a means of contrasting the rated probability for each event.

**Results**

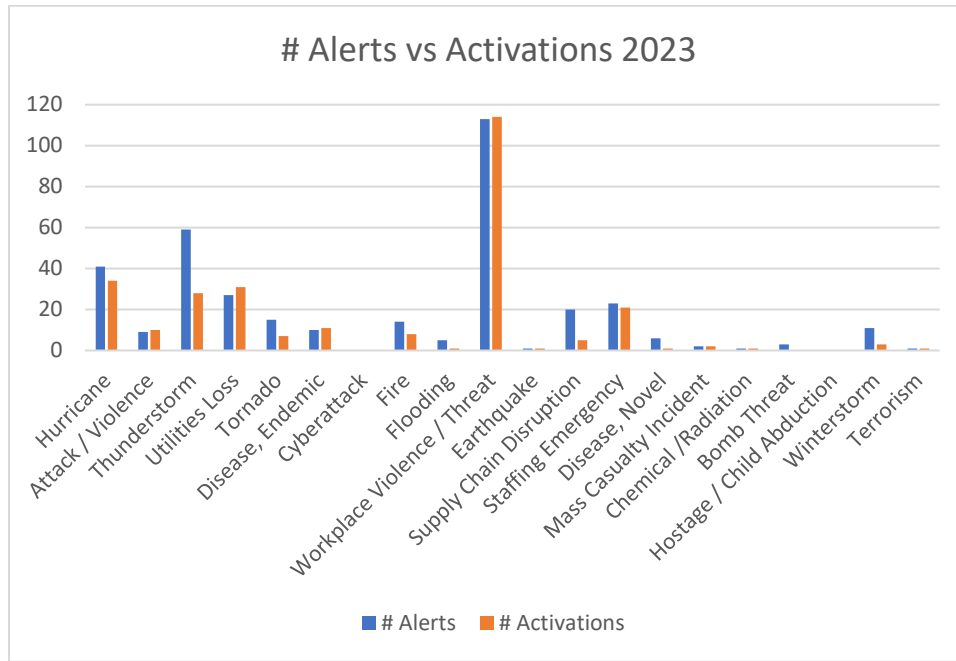
**Activations**

Data collected shows the workplace violence led the number of activations where emergency plans or command/coordination centers were activated, either partially or fully, with 114 events reported from HCC partner respondents followed by Hurricane, Utilities Loss, Thunderstorm, and Staffing Emergencies rounding out the top 5 alert events for BP5.

Hazard	# Alerts	# Activations
1. Workplace Violence / Threat	113	114
2. Hurricane	41	34
3. Utilities Loss	27	31
4. Thunderstorm	59	28
5. Staffing Emergency	23	21
6. Disease, Endemic	10	11
7. Attack / Violence	9	10
8. Fire	14	8
9. Tornado	15	7
10. Supply Chain Disruption	20	5

<sup>4</sup> Member types designated as “core members” by ASPR in the Hospital Preparedness grant and its guidance were listed with a blue highlighting in the survey, but results determined that it was not necessary and did not affect the survey collection itself.

Other hazards with reported member activations, but not in the top 10 hazards, included Winter Weather, Mass Casualty Incidents, Flooding, Earthquake, Novel Disease, Chemical/Radiation events, and Terrorism.

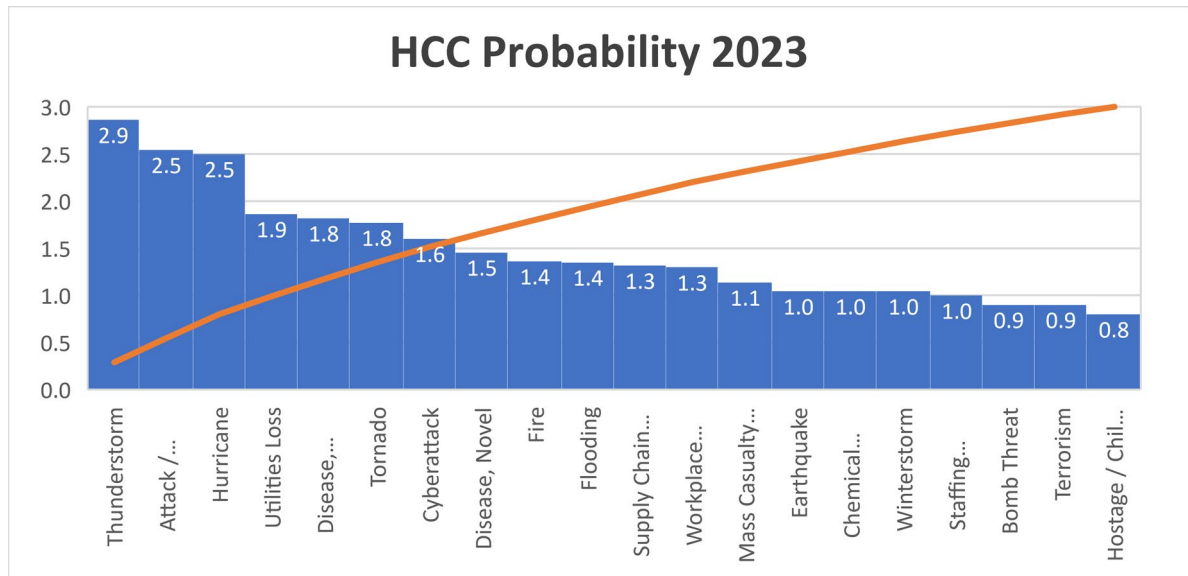


### Probability of Hazards

Regarding potential of events that may occur based on the last decade of history and a relative outlook over the next decade reported a top 10 most probable hazards.

Hazard	Probability
1. Thunderstorm	2.9
2. Attack / Violence	2.5
3. Hurricane	2.5
4. Utilities Loss	1.9
5. Disease, Endemic	1.8
6. Tornado	1.8
7. Cyberattack	1.6
8. Disease, Novel	1.5
9. Fire	1.4
10. Flooding	1.4

Trailing closely behind number 10-Flooding was Supply Disruption and Workplace Violence with only a tenth of a point putting them behind the top 10.



### Relative Risk

The main goal of the HVA is to establish relative risk of hazards to better align strategic decision-making regarding allocation of funding, prioritization of projects, and direction of planning, training, and exercise efforts for the upcoming year.

The following table sets the top 10 hazards identified for the Pee Dee HCC in BP5 (FY24):

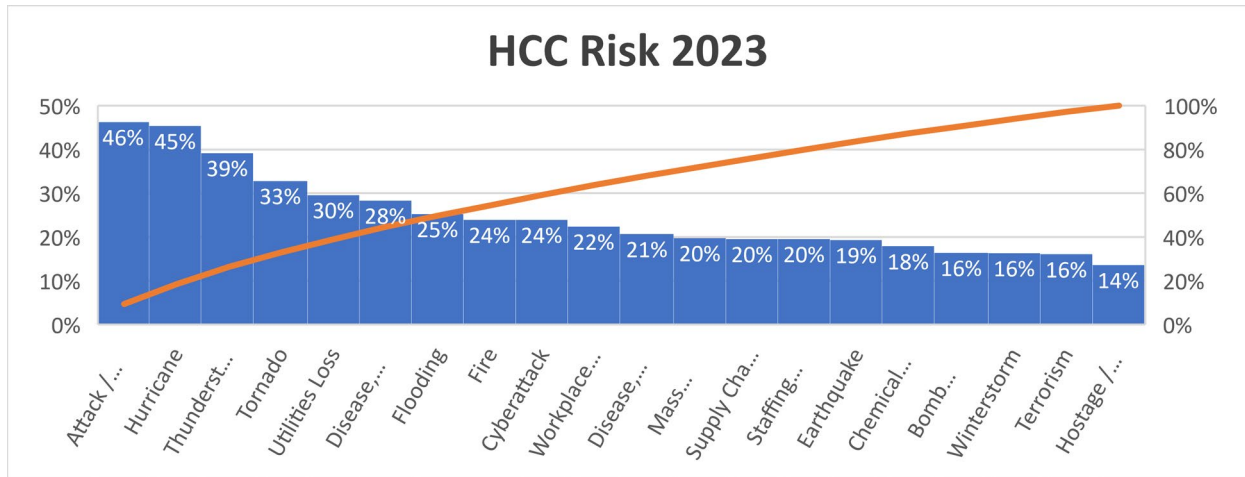
Hazard	Risk
1. Attack / Violence	46%
2. Hurricane	45%
3. Thunderstorm	39%
4. Tornado	33%
5. Utilities Loss	30%
6. Disease, Endemic	28%
7. Flooding	25%
8. Fire	24%
9. Cyberattack	24%
10. Workplace Violence / Threat	22%

Following closely behind with 20-21% was the 4 other hazards. Those are Novel Disease Outbreak, Mass Casualty Incidents, Supply Chain Disruption, and Staffing Emergencies.

The results that Workplace Violence led the # of activations, but the risk was deemed higher from attacks or violence may be telling. The results may reveal that there is some confusion between Workplace Violence (violent threats/acts made by current or former workers and their immediate families) and Attacks or Violence (violent attacks made by customers or



individuals not part of their workforce) since the number of activations for the hazard ranked as #1 was much lower.



As contrast the last 2 years HVA reported top 10 hazards were:

Rank	2023	2022	2021
1	1. Attack / Violence	Hurricane	Tornado
2	2. Hurricane	HVAC Failure	Pandemic
3	3. Thunderstorm	Pandemic	Inclement Weather
4	4. Tornado	Inclement Weather	Hurricane
5	5. Utilities Loss	Infectious Disease Outbreak	Infectious Disease Outbreak
6	6. Disease, Endemic	Workplace Violence / Threat	Flood, External
7	7. Flooding	Chemical Exposure, Internal	Communication/Telephony Failure
8	8. Fire	Active Shooter	Active Shooter
9	9. Cyberattack	Communication/Telephony Failure	Cyber Attack
10	10. Workplace Violence / Threat	Trauma	Evacuation

**Analysis**

Hurricanes, Thunderstorms/Tornados (Inclement Weather), Utility Loss (HVAC/Telephony), Endemic Disease (Infectious Disease Outbreaks), and both Attacks/Violence (Active Shooter) plus Workplace Violence/Threats continue to be the most probable and highest risk events for the region with all of these appearing in the top 10 hazards 3 years in a row and several repeatedly in the top 5.

The overall recommendation would be to focus the efforts on planning, resources, plus Training & Exercise activity during this budget period as well as the initial periods for the next budget cycle with these hazards in mind.