

Metrolina Healthcare Preparedness Coalition Hazard Vulnerability Analysis 2020-2021

Introduction and Summary Findings

The Metrolina Healthcare Preparedness Coalition is required to perform a regional hazards and vulnerabilities analysis (HVA) every three (3) years with review and maintenance performed on an annual basis. This is a condition of funding and is set forth by the United States Assistant Secretary for Preparedness and Response (ASPR). While ASPR does not specify any specific methodology, the HVA must be regional in its scope and address vulnerable populations such as pediatric and geriatric.

During fiscal year 2020-2021, the HVA was accomplished using the Kaiser-based tool first utilized in the 2019-2020 process. This HVA tool utilized is similar to that created by Kaiser Permanente in that it calculates a Relative Impact and Relative Threat based on user-defined input for specific threats and hazards.

Given the regional impact of the SARS-CoV-2, the 2020-2021 HVA process was modified. Originally, regional feedback was to be solicited during the December 2020 Quarterly Meeting. This meeting was to be held virtually. However, that meeting was canceled due to regional workload in support of pandemic efforts. Instead, the HVA scoring was undertaken using a combination of regional trends and partner feedback obtained during the 2019-2020 process.

Ranked according to Relative Impact and Relative Threat, the top five threats identified during the process are:

Table 1: 2020-2021 Top Five Regional Threats

<u>Event</u>	<u>SEVERITY</u>	<u>RISK (Severity x Probability)/54</u>
	<u>Relative Impact if this event occurs</u>	<u>Relative Threat</u>
	<u>6 to 18</u>	<u>0 - 100%</u>
Infectious Disease Pandemic	18	100%
Cyberattack	14.5	81%
IT Faliure (EMR, network, Internet, etc.)	13.5	75%
Regional Critical Supply/Pharm Shortage	13.5	75%
Infectious Disease Outbreak	13	72%
Personnel Shortage	12.5	69%

Complete results appear on page 5 of this document (Table 2).

Background

During the 2019-2020 effort, the tool-driven approach was generally well received by regional partners and was retained for the 2020-2021 assessment. Modifications to the tool itself and to the threats and hazards were made based upon regional feedback and commentary from last year’s regional HVA meeting (Table 2).

Table 2: Open Issues and Recommendations from 2019-2020 HVA

<u>Item or Issue</u>	<u>Observation/Recommendation</u>	<u>Additional Actions</u>
I. Scope		
“Regional” threat/hazard is poorly defined	Evaluate threat/hazard primarily according to first-order or reasonable second and third impact(s)	
II. Threat/Hazard Definitions		
<i>Workplace violence</i> – vague definition	Follow OSHA guidelines: https://www.osha.gov/workplace-violence	
<i>Medical Surge</i> – tightly define or leave intentionally open	Leave open	
<i>Mental health-type event</i> vague	Further define	Removed entirely as mental health consequences are already considered in the Human Impact section of the HVA Instructions
<i>Nuclear event</i> – differentiate failure from intentional act	Create separate threat/hazard for fixed facility compromise/meltdown vs intentional act	
<i>IT Failure</i> – differentiate from intentional act	Create separate threat/hazard for failure vs intentional act	<i>Cyberterrorism</i> renamed to <i>Cyberattack</i> and placed into the Man-made Events section
<i>Large fire</i> – differentiate from <i>Wildfire</i>	Create separate category for non-wildfire	“Urban/residential or commercial” added to <i>Large Fire</i> description
III. Scoring and Tool Guidance		
Natural events that had never occurred prior were mathematically assigned a 0% probability	Re-visit scoring criteria and introduce additional scoring considerations	0 value removed from Likelihood scoring criteria

Rationale

Ideally, this effort would be undertaken in manner consistent with the 2019-2020 HVA process, either in person or collectively via remote means. However, given the regional impacts of and efforts against the current pandemic, these options were not available.

Partner input collected during the 2019-2020 HVA process was implemented during the 2020-2021 process. This input broadly addressed three major categories: scope, threat/hazard definitions, and scoring and tool guidance. The question of scope examined two related issues. First, the idea of a regional assessment was broad in that it did not provide explicit guidance as to what constituted “regional” aside from geographic boundaries, specifically as it related to healthcare institutions and agencies. In other words, to what extent should community impacts – those not directly linked to healthcare institutions or agencies – be evaluated during the assessment? Should a water supply interruption *not* strictly originating in a hospital be considered, for example? Second, regional partners desired to better delineate scoring as it related to first, second, or third order impacts.

During the 2019-2020 HVA meeting, threats and hazards were modified to fit regional needs. Some of these threats and hazards were left open for further discussion. These modifications typically either more narrowly defined certain threats/hazards, or separated these threats/hazards from other similar ones.

Finally, the scoring process itself was problematic in that natural events (such as a pandemic or an earthquake) automatically were scored as a zero-risk event based upon probability scoring. Events that had never occurred prior were scored as “0 probability”.

Methodology

Changes to some threats/hazards were made according to regional input and then scored according to a revised set of criteria. Many of the perennial regional threats/hazards were left intact and their associated scores were carried over from last year.

Weather events such as *Hurricane/Tropical Storm* and *Severe Thunderstorm* were left unchanged. Likewise, *CBRNE/Terrorism* and *Major HAZMAT Incident* remained unchanged. In both sets of examples, there have been little to no data or changes in frequency to alter event probability. Conversely, threats/hazards such as *Infectious Disease Pandemic* and *Personnel Shortage* were re-evaluated in light of recent events.

A small number of threats/hazards were modified so as to provide more clear meaning or removed altogether. The mental health component of a threat/hazard was an existing factor to be considered when scoring the Human Impact section of the HVA tool (both for patients as well as providers/staff). With that in mind, a separate category for mental health emergencies seemed unnecessarily vague and redundant.

Cyber Terrorism was moved into the Man-made or MCI category of the tool and renamed *Cyber Attack*. Cyberterrorism is narrowly defined, while cyberattack allows for state, non-state, and criminal actors. This also allows cyberattack to be viewed as a threat rather than a hazard.

In terms of scoring and tool-oriented changes, the 0 value was removed. Initially, had a naturally occurring or facility/technological event not occurred in the region, it was assigned a likelihood of 0, resulting in a total risk of 0. Changes to wording or criteria were initially proposed. However, this 0 score was removed entirely with the assumption that any event appearing in a region-specific HVA should have a non-zero likelihood. Phrased differently, if a threat or hazard has zero chance of happening, then we as a region should not be giving it any further evaluation. Finally, “[i]nput based upon assessment by applicable subject matter experts” was added to the Instructions section of the HVA tool. This is to be referenced when scoring probability and is in addition to “[k]nown Risk”, “Historical Data”, and “Vendor and/or Manufacturer Statistics”.

Results

After modifying the tool and re-scoring, results were mixed in terms of threat/hazard category (Table 2). While many of the hazards categorized as Natural Events were largely unchanged from last year’s results, the risk score for *Infectious Disease Pandemic* increased substantially. Likewise, *IT Failure* and the risk of *Cyberattack* remained consistent.

The risk of both *Regional Critical Supply/Pharmacy Shortage* and *Personnel Shortage* increased substantially. This was in part due to those events not being scored during last year’s effort due to time constraints.

Previously unscored events were assessed according to the HVA tool’s parameters.

Table 2: 2020-2021 Regional HVA Results

<u>EVENT</u>	<u>SEVERITY</u> <u>Relative Impact if this event</u> <u>occurs</u>	<u>RISK</u> <u>(Severity x</u> <u>Probability)/54</u> <u>Relative Threat</u>
	6 – 18	0 – 100%
Infectious Disease Pandemic	18	100%
Cyberattack	14.5	81%
IT Failure (EMR, network, Internet, etc.)	13.5	75%
Regional Critical Supply/Pharm Shortage	13.5	75%
Infectious Disease Outbreak	13	72%
Personnel Shortage	12.5	69%
Med Surge	12	67%
Hurricane/Tropical Storm	11	61%
Tornado or Microburst	11	61%
Active Shooter incident	11	61%
Flood with potential for disruption/harm	9.5	53%
Workplace Violence	9.5	53%
Heat Wave	9	50%
CBRNE/Terrorism	13	48%
Winter Weather Event	8	44%
Major HAZMAT Incident	12	44%
Severe Thunderstorm	7.5	42%
Wildfire	11	41%
Fuel Shortage	11	41%
Mass Casualty Incident - General Injuries / Trauma	6.5	36%
Large Fire (urban/residential or commercial)	13	24%
Massive Transportation Disruption / Failure	11.5	21%
Regional Sewer / Water Treatment Failure	17	16%
Regional Water Disruption / Interruption	17	16%
Earthquake likely to cause structural damage - define criteria	15	14%
Regional Communications Disruption	7.5	14%
Nuclear Event	13	12%
VBIED or IED	13	12%
Regional Natural Gas Disruption	9.5	9%
Regional Electrical Failure (i.e. blackout)	8.5	8%

Discussion

The 2020-2021 HVA process was imperfect. As mentioned previously, this HVA process would have mirrored that of last year's, or, at the least, have been predicated on regional partner input. With that said, there may be some value in the findings.

The most obvious shift in risk is seen in *Infectious Disease Pandemic*. This is perhaps obvious and needs no explanation. Risk scores for both *Personnel Shortage* and *Regional Critical Supply/Pharmacy Shortage* increased as well, moving from 64% to 69% and from 0% (previously unscored) to 75% respectively. Both of these events are currently ongoing to some degree and can be seen as directly related to the SARS-CoV-2 outbreak. Though unknown, the risk of both events may be persistent, even post-pandemic, and therefore extend into 2021. Long term impacts to staffing and the availability of supplies (including personal protective equipment) remain to be seen.

During the 2019-2020 HVA meeting, the threat of *Cyberattack* was scored highly. Besides the frequency of such events, the region felt that the constant evolution of malware and its attack vectors as well as of the perpetrators themselves constituted a persistent high risk. The dynamic nature of the threat means that regional mitigation efforts are never truly sufficient. This rationale was preserved during the 2020-2021 HVA process.

Finally, events that occur reliably or maintain relatively consistent probability were scored using last year's regional input.

Future Outlook and Proposed Timeline: FY2021-2022

This document will be disseminated to regional partners for evaluation and feedback. Regional partners will be asked to examine the changes made to both the events and to the tool itself and then to approve or reject these changes. If rejected, a collaborative revision effort will be undertaken with the goal of creating an agreed-upon HVA tool.

Once a satisfactory tool is produced, the assessment process will more closely resemble that of FY2019-2020, whether in-person or via remote means.

Appendix A: HVA Tool Template

MHPC 2020-2021 Regional HVA (12/2020)										
EVENT	Probability	Severity = Magnitude + Mitigation						SEVERITY	RISK (Severity x Probability)/54	
		Magnitude (negative consequences of impact)			Mitigation					
	Likelihood this will occur	Human Impact	Property Impact	Business Impact	Regional Preparedness	Internal Resources	Regional Resources	Relative Impact if this event occurs	Relative Threat	
SCORE	.5 = Minimal 1 = Low 2 = Moderate 3 = High	0 = None .5 = Minimal 1 = Low 2 = Moderate 3 = High	0 = \$0 1 = Low 2 = Moderate 3 = High	0 = None 1 = Low 2 = Moderate 3 = High	0 = n/a 1 = High 2 = Moderate 3 = Low	0 = n/a 1 = High 2 = Moderate 3 = Low	0 = n/a 1 = High 2 = Moderate 3 = Low	6 to 18	0 - 100%	
Natural Events	Earthquake likely to cause structural damage - define criteria	0.5	2	3	3	3	2	2	15	14%
	Flood with potential for disruption/harm	3	0.5	2	2	1	2	2	9.5	53%
	Heat Wave	3	2	1	1	1	2	2	9	50%
	Hurricane/Tropical Storm	3	3	3	2	1	1	1	11	61%
	Infectious Disease Pandemic	3	3	3	3	3	3	3	18	100%
	Infectious Disease Outbreak	3	2	2	3	2	2	2	13	72%
	Large Fire (urban/residential or commercial)	1	2	3	3	3	1	1	13	24%
	Wildfire	2	1	3	3	2	1	1	11	41%
	Severe Thunderstorm	3	0.5	1	1	1	2	2	7.5	42%
	Tornado or Microburst	3	1	2	3	1	2	2	11	61%
Winter Weather Event	3	1	2	2	1	1	1	8	44%	
MCI & Man-Made Events	Workplace Violence	3	0.5	1	1	3	2	2	9.5	53%
	Active Shooter incident	3	1	2	3	1	2	2	11	61%
	CBRNE/Terrorism	2	2	3	3	1	2	2	13	48%
	Mass Casualty Incident - General Injuries / Trauma	3	0.5	1	1	1	2	1	6.5	36%
	Med Surge	3	2	2	3	1	2	2	12	67%
	Major HazMat Incident	2	1	3	3	1	2	2	12	44%
	Nuclear Event	0.5	3	3	3	1	1	2	13	12%
	Cyberattack	3	0.5	3	3	3	2	3	14.5	81%
Facility & Technological Events	VBIED or IED	0.5	3	3	3	2	1	1	13	12%
	Fuel Shortage	2	1	1	3	3	1	2	11	41%
	Personnel Shortage	3	0.5	3	3	0	3	3	12.5	69%
	IT Failure (EMR, network, Internet, etc)	3	0.5	3	3	2	2	3	13.5	75%
	Massive Transportation Disruption / Failure	1	0.5	2	2	2	3	2	11.5	21%
	Regional Critical Supply/Pharm Shortage	3	0.5	3	3	1	3	3	13.5	75%
	Regional Communications Disruption	1	0.5	1	1	3	1	1	7.5	14%
	Regional Electrical Failure (i.e. blackout)	0.5	0.5	1	2	1	2	2	8.5	8%
	Regional Natural Gas Disruption	0.5	0.5	1	1	3	2	2	9.5	9%
	Regional Sewer / Water Treatment Failure	0.5	2	3	3	3	3	3	17	16%
Regional Water Disruption / Interruption	0.5	2	3	3	3	3	3	17	16%	

Appendix A: HVA Tool Template (cont.)

Regional Healthcare Coalition Hazard Vulnerability Tool

Factors considered when determining **probability** of hazards will include, but are not limited to:

- 1) Known Risk (i.e., previously identified in a Hospital, Local, State or Federal HVA)
- 2) Historical Data
- 3) Vendor and/or Manufacturer Statistics
- 4) Input based upon assessment by applicable subject matter experts

Factors considered when determining **response** requirements will include, but are not limited to:

- 1) Time required to marshal an immediate response
- 2) Anticipated scope of response required to mitigate hazard
- 3) Historical challenges and best practices for responding to the specific hazard

Factors considered when determining the **human impact** of hazards will include, but are not limited to:

- 1) Potential for staff injury and/or death (including mental health consequences)
- 2) Potential for patient injury and/or death (including mental health consequences)

Factors considered when determining the **property impact** of hazards will include, but are not limited to:

- 1) Cost to replace or repair impacted property
- 2) Cost to implement and operate a temporary replacement for impacted property

Factors considered when determining the **business impact** of hazards will include, but are not limited to:

- 1) Projected losses due to interruption of hospital services resulting from hazard
- 2) Projected losses due to workers compensation claims resulting from hazard
- 3) Projected losses from violations of contractual / legal agreements resulting from hazard
- 4) Projected losses from litigation resulting from hazard
- 5) Projected losses from fines and/or penalties resulting from hazard
- 6) Projected losses from utilization of critical supplies (including restocking costs)

Factors considered when determining the level of **regional preparedness** for hazards will include, but are not limited to:

- 1) Status of current plans (regional, hospital and community)
- 2) Status of training and education (i.e., how knowledgeable are staff with respect to their role in responding to specific hazards)
- 3) Status and avidity of insurance
- 4) Status and avidity of back-up / redundant systems

Factors considered when determining the level of **internal resources** available to use in response to hazards include, but are not limited to:

- 1) Type of equipment, supplies and pharmaceuticals available in facilities to respond to specific hazard
- 2) Volume of equipment, supplies and pharmaceuticals in facilities to respond to specific hazard
- 3) Projected hospital staff that could be marshaled to respond to specific hazard

Factors considered when determining the level of **regional resources** available to use in response to hazards include, but are not limited to:

- 1) Type of equipment, supplies and pharmaceuticals available through regional agreements and caches to respond to specific hazard
- 2) Volume of equipment, supplies and pharmaceuticals available through regional agreements and caches to respond to specific hazard
- 3) Projected staff that could be marshaled through community, regional, state and federal agreements

