NORTHWEST HEALTHCARE Response Network.

NWHRN Healthcare System Hazard Vulnerability Assessment

Prepared by:

The Northwest Healthcare Response Network

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PROJECT OVERVIEW

Introduction

The Northwest Healthcare Response Network (NWHRN) has a unique and vital role in disaster planning, response, and recovery within the service area that includes 15 counties and 25 sovereign tribal nations in western Washington. NWHRN is a backbone organization that leads a coalition of healthcare organizations, public health leaders and emergency response partners to ensure communities across our state can get needed healthcare services during emergencies and disasters. This is the heart of our mission during any kind of crisis. Our goal is that every patient gets the health care they need when emergencies happen.

Before disasters happen, NWHRN leads multi-agency and cross jurisdictional initiatives across the region to prepare healthcare organizations and our response partners through collaborative planning, information sharing, engagement, training, exercises, and advocacy. To help assure preparedness and response activities align with identified healthcare and regional vulnerabilities, NWHRN collaborated with tribal, healthcare, public health, emergency medical services, fire, and emergency management partners to assess hazards in its coalition service area to assess the annual healthcare system focused Hazard Vulnerability Assessment (HVA).

In 2022, NWHRN began supporting the HVA process for the SW Washington Healthcare Alliance thereby creating an HVA process and report that provided consistency across western Washington and was included in the 2022 report.

This year, NWHRN was asked to conduct and oversee the HVA process for central and eastern Washington creating a consistent process of gathering results and reporting across the entire state. To provide both a localized and multijurisdictional lens, NWHRN decided to conduct three HVA meetings across each of the pre-established catchment areas within central and eastern Washington; Wenatchee, Spokane and Tri-Cities catchments. This allowed the gathering of more accurate results for each geographic area, recognizing that different hazards will have varying likelihood and impact on healthcare systems depending on the location. In addition, by conducting the healthcare HVA in a consistent manner across the entire state, there will now be a local (district, catchment, and Healthcare Alliance) report as well as an overall assessment for the entire state of Washington.

Purpose

HVAs form the basis of emergency management programs and assist in prioritizing organizational activities and resources. The original HVA served as a compliment to individual facility and healthcare organization HVAs by developing a hazard analysis for the healthcare community at both a coalition-wide as well as individual district-based levels. The purpose of the HVA review is to provide an ongoing assessment of the healthcare coalition HVA to ensure the analysis continues to provide an accurate representation of the hazards that will have the greatest impact to healthcare. Specific objectives to achieve this goal include:

- For central and eastern Washington: Gather a baseline evaluation of each hazard within the three catchment areas.

- For the NWHRN coalition service area and SW Washington Healthcare Alliance: Review the ranking of identified hazards from the previous HVA rankings and update as appropriate.
- Introduce the concept of "general risk" into determining the likelihood of each hazard in addition to historical data. This allowed participants to incorporate additional factors such as healthcare facilities location and proximity to a particular hazard, aging infrastructure, the level of a facility's internal infrastructure and redundancies.
- During the review process, determine if certain hazards are impactful to healthcare and should remain as a standalone hazard, or if they should be removed and incorporated into other hazard definitions or as stressors.
- Update hazard definitions to better determine the specific impacts the hazard may have on the healthcare system.
- Add any additional hazards that were not previously identified and provide an opportunity for those hazards to be voted on.
- Using the collected data to produce a total of nine HVAs: A full coalition HVA discussing hazards and their healthcare impacts, as well as four district HVAs, three central and eastern Washington catchment areas, and the SW Washington Alliance service area providing a risk analysis for each geography.
- Share the findings of the project with local, regional, tribal and/or state partners.

The project was divided into three major phases:

- **Phase 1:** Internal review of current coalition HVA and county, city, state, and tribal HVA's.
- **Phase 2:** Focus group-based discussions and data gathering with district, central and eastern Washington, and SW Washington Alliance partners.
- **Phase 3:** Compile and update data based on group discussions.

REVIEW AND VALIDATION

When reviewing the feedback provided by partners during the 2022 HVA review, there were no major changes to hazard definitions since incorporating the feedback from the 2021 review. When creating the slide deck for the central and eastern Washington HVA meetings, we took into consideration that certain hazards that had been voted on in the 2022 HVA should be re-introduced this year so the participants in each of the catchment areas could determine which hazards best fit their geographic locations and which did not. Through the validation process, there are hazards that will appear in certain districts and catchment areas that will not appear in others. This is based on the hazard validation process that demonstrates the importance of

acknowledging the diversity in our geography across the state and how the hazards will impact healthcare differently.

Early in the HVA meetings, partners identified two hazards that they wanted to have added into the healthcare coalition HVA. These hazards were presented and discussed by participants, a general definition was created and then both hazards, Radiological Event and Workplace Violence , were voted into inclusion. Due to the timing of when these two hazards were proposed, not every group of participants had the opportunity to vote on them this year. One additional hazard was presented and voted on at the North District HVA meeting which was Geomagnetic Event. Geomagnetic Event was not voted on outside of the North District however, NWHRN will include it as a standalone hazard for 2023. .. . During the 2024 HVA meeting cycle, all hazards will have an opportunity to be reviewed and brought to a vote.

To see the original list of hazards follow the link here: 2022 HVA

The same definitions of impact were utilized during the review process, however when calculating likelihood, participants were asked to incorporate general risks into their evaluation of the likelihood. Consistent with the original HVA under review, NWHRN used the following definitions for the likelihood of a hazard occurring:

- Low
  - *Chance*: Could occur at some time.
  - *Frequency*: Has occurred 3 times or less in the past 10 years.
  - Probability: <35%
- Moderate
  - *Chance*: Might occur at some time.
  - *Frequency*: Has occurred more than 4-6 times in the past 10 years.
  - Probability: 35-65%
- High
  - *Chance*: Will likely occur in most circumstances.
  - *Frequency*: Has occurred at least 7 times in the past 10 years.
  - Probability: >65%

Likelihood & Impact Ranking Key
Green = Low
Yellow = Moderate
Red = High

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HAZARDS

Hazard	Definition
Avalanche	A mass of loosened snow or ice that suddenly, and usually swiftly, slides down a mountain, growing by collecting additional material as it descends
Cyber Threat	A human-caused technological threat. It can be caused accidentally from faults in software programming code, or deliberately by malicious hackers. Cyber Threats are disruptions to information technology, communications systems, and/or critical infrastructure. They can be caused accidentally from faults in software programming code, for example, or deliberately by malicious agents. This hazard considers actual disruptions or successful attacks on our healthcare systems
Dam failure	A dam is an artificial barrier built across a watercourse to impound or divert water. Dam Failure is the sudden, rapid, and uncontrolled release of impounded water resulting in downstream flooding.
Drought	Drought is a prolonged period of low precipitation severe enough to reduce soil moisture, water, and snow levels below the minimum necessary for sustaining plant, animal, and economic systems.
Earthquake: Minor damage	An earthquake is shaking of the ground caused by a sudden slip on a fault. Specifically, minor damage earthquake is defined as Modified Mercalli Intensity (MMI) I-VII ranging from not felt to minor structural damage (6 or below on Richter magnitude scale). Frequency: thousands per year in WA. (Previously identified under the hazard Earthquake)
Earthquake: Major damage	An earthquake is shaking of the ground caused by a sudden slip on a fault. Earthquakes can result in a variety of primary and secondary hazards. Modified Mercalli Intensity (MMI) VIII-X+ ranging from destructive to catastrophic (above 6 on Richter magnitude scale). Frequency: 1 every 15 years. (Previously identified under the hazard Earthquake)
Energy emergency	Energy emergencies include any disruption to the energy infrastructure of Western WA. This includes power outages and pipeline incidents. For power disruptions specifically loss of main power (8+ hours) impacting ability to perform normal patient/resident care.
Erosion- Waterways, Tributaries, Rivers, Coastal	Erosion- Waterways, Tributaries, Rivers, Coastal hazards in Washington include water way, river, tributary, and coastal manifestations of region-wide hazards stemming from events such as earthquake, tsunami, severe storms and flooding, as well as hazards unique to the coast, including coastal Erosion- Waterways, Tributaries, Rivers, Coastal , tidal inundations and climate change-induced sea level rise.

Fire: Structure	A fire that directly impacts a structure whether that be a healthcare facility or structure within the community.
Flooding	Washington is very prone to flooding. Flooding typically occurs after the Cascades experience large, wet and warm weather systems after winter snowpack has accumulated during the winter months. Climate change is projected to increase the frequency of strong atmospheric rivers and accelerate snowmelt, increasing the likelihood of flooding.
Geomagnetic event	A geomagnetic storm is a major disturbance of Earth's magnetosphere that occurs when there is a very efficient exchange of energy from the solar wind into the space environment surrounding Earth. These storms result from variations in the solar wind that produce major changes in the currents, plasmas, and fields in Earth's magnetosphere. During storms, the currents in the ionosphere, as well as the energetic particles that precipitate into the ionosphere add energy in the form of heat that can increase the density and distribution of density in the upper atmosphere, causing extra drag on satellites in low-earth orbit. The local heating also creates strong horizontal variations in the in the ionospheric density that can modify the path of radio signals and create errors in the positioning information provided by GPS and Global Navigation Satellite Systems (GNSS) and create harmful geomagnetic induced currents (GICS) in the power grid and pipelines.
Hazardous Materials	Hazardous Materials incidents include the unwanted, unplanned, or deliberate release or escape of substances that may cause or create a potential risk to public health, safety, or the environment.
Health Incident	Health includes disease outbreaks, pandemics, and bioterrorism incidents. An outbreak can be characterized by the extent of spread of the disease.
Heat: Extreme	Temperatures substantially hotter and/or more humid than average and posing a high or very high risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration. Climate change will increase the frequency, duration, and intensity of extreme heat events.
Landslide	Landslides occur when gravity overcomes the strength of the soil and rock in a slope, often with the help of contributing factors such as heavy rainfall, Erosion- Waterways, Tributaries, Rivers, Coastal of the toe of a slope, ground shaking, or human action. Landslides also include debris flows, mudslides, and mudflows.
Mass Casualty Attack- Simplex Attack	Simplex attack: Single confined location, Majority of injuries are trauma. Often short duration incident. (Previously identified under the Terrorism Hazard).

Mass Casualty Attack-Complex Attack	Complex attack: Often multiple locations, injury types range from trauma, burn, chemical, etc. May include the targeting of critical infrastructure. Highly dynamic and variable in duration. (Previously identified under the Terrorism Hazard).
Radiological event	Radiation emergencies are non-routine situations or events that require prompt action to mitigate a radio-nuclear hazard or its adverse consequences for human life, health, property, or the environment. Radiological emergencies are situations involving radiation exposure from a radioactive source. Radiation emergencies may result from misuse of radioactive sources during industrial, medical or research applications, accidental exposure to uncontrolled (abandoned, lost, or stolen) radiation sources, accidents during transport of radioactive materials, but also can be combined with conventional emergencies (a fire or a release of chemical substances), natural disasters, military conflicts, or malicious acts involving radiation sources.
Severe weather	An atmospheric disturbance featuring sustained strong winds (40+ mph) and/or significant precipitation (rain or snow). Climate change is anticipated to increase the intensity of storms.
Social Unrest	A wide range of activities from violent to peaceful, legal to illegal, criminal to principled and highly planned to completely spontaneous which disrupts a community or organization. Many of these events can be broadly categorized as civil disturbances.
Supply Chain	An interruption to the network of suppliers, storage facilities, transporters, and distributors involved in the production, delivery, and sale of critical products.
Transportation	Aviation, surface (road, rail, and pipeline) and marine where a vehicle accident is the primary impact.
Tsunami & Seiches	A tsunami is a series of waves typically generated during an earthquake by sudden displacement of the sea floor or lakebed. Seiches are water waves generated in enclosed or partly enclosed bodies of water by the passage of seismic waves (ground shaking) caused by earthquakes.
Volcanos & Lahars	Washington State has five active volcanoes (defined as a vent in the earth's crust through which magma, rock fragments, gases, and ash are ejected from the earth's interior): Mount Baker, Glacier Peak, Mount Rainier, Mount St. Helens, and Mount Adams.
Wildfire: Direct Impact	Direct Impact is an uncontrolled fire starting in an area of combustible vegetation that directly threatens a healthcare facility. Climate change projections anticipate an increase in wildfire conditions throughout Washington. (Previously identified under the hazard Fire-Wildland/WUI)

Wildfire: Indirect impact	Indirect Impact is an uncontrolled fire starting in an area of combustible vegetation that is impacting a community at large. Climate change projections anticipate an increase in wildfire conditions throughout Washington. (Previously identified under the hazard Fire-Wildland/WUI)
Workplace Violence	Any act or threat of physical violence, harassment, intimidation, or other threatening disruptive behavior that occurs at the healthcare workplace. It can affect and involve workers, clients, patients, and visitors.

METHODS

A modified version of the Delphi Technique was used for the HVA review process of assessing the hazard impact and risks. The Delphi Technique is a method of consensus building involving collating the judgment of a small group of subject matter experts. This technique was chosen based on its success in previous HVA projects conducted by the Northwest Healthcare Response Network. The main modification to the technique is the limitation of the information review to a single round of virtual focus groups for each focus group, rather than including a second-round distribution of an online survey to a wider audience.

For each focus group, participants were provided background information on the project, an overview of established hazards and asked to assess two components of each hazard: the likelihood of the hazard occurring, and the impact of the hazard to the local and regional healthcare infrastructure if the hazard were to happen. For the hazard likelihood, focus group participants within the western Washington NWHRN service area and SW Washington Healthcare Alliance, were asked for their assessment and vote on the current rating of the likelihood derived from the 2022 Coalition HVA. Participants had an opportunity to vote to either keep the current rating or to change it. Following the discussion on likelihood, participants were asked to evaluate and vote on the potential local level healthcare infrastructure impact of each hazard and once again vote to either keep the current impact rating or change it. Participants were asked to evaluate potential impacts in four general categories:

- Public Health and Patients – Impact of hazard to people/patients
- Facility – Impact of hazard to healthcare facility/facilities
- Infrastructure – Impact of hazard to healthcare related resources (medical supplies/equipment, PPE, etc.)
- Other – Other potential healthcare impacts (staffing shortages, etc.)

Each hazard can result in impacts to one or more of these four categories, and the severity of the impact may differ between each category. After reviewing the impact of each hazard and holding an open discussion, participants were asked to provide a rating of the hazard using a three-point Likert-type scale (low, moderate, or high). NWHRN provided the following definitions to guide participants in ranking impact:

- Low – Causes minimal disruption and can be managed at the daily operational level

- Moderate – Cannot be managed through normal operational means (e.g., activation of incident command structure and/or emergency operations plan) but does not threaten the ability of the regional healthcare system to continue providing essential services
- High – Cause significant disruption and threatens the ability of the regional healthcare system to continue to provide essential services

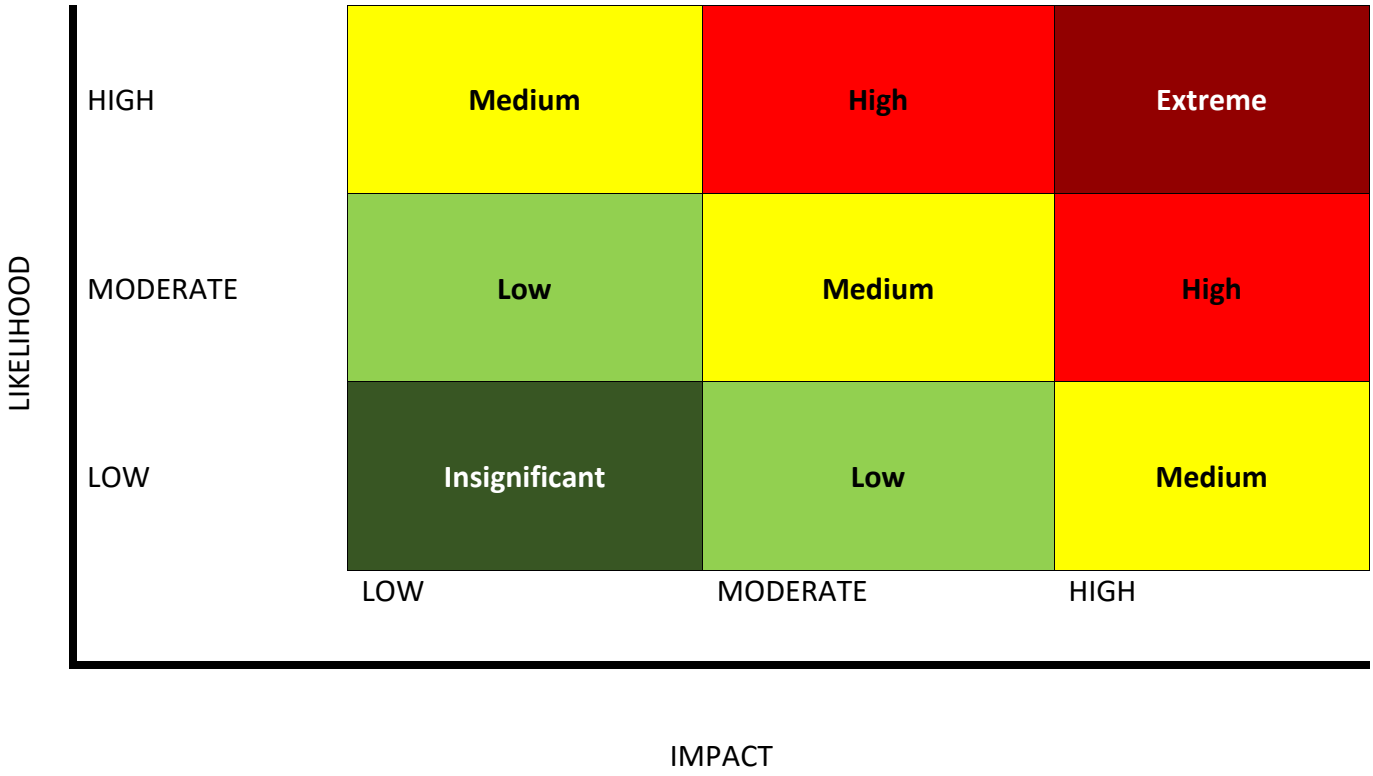
Once participants voted on hazards impact, utilizing a virtual polling feature, results were displayed to the group. Hazards were deemed to have reached ranked consensus if at least 60% of the focus group participants agreed on the ranking. If consensus was not met, there was an option for further discussion to see if there were any adjustments to people's voting. If consensus was not reached that was noted during the meeting and in the report any hazards that have an astricts by them represent hazards that did not reach consensus as defined above.

For central and eastern Washington participants this was the first year of evaluating hazards in this manner, establishing a baseline.

Risk Matrix

Hazards reaching consensus for both likelihood and impact ratings were then plotted on a hazard risk matrix to create a final risk profile. This risk matrix provides a high-level summary of the stratified hazard risk levels for each district with those hazards considered high in likelihood and impact are rated as 'extreme,' and those with low likelihood and impact are rated as 'insignificant'.

Figure 1: Hazard Risk Matrix Template



STATE-WIDE RESULTS & ANALYSIS

The purpose of the annual HVA review process is to ensure that the results of the healthcare HVA remain accurate, up to date, and represent a current list of the most impactful hazards and vulnerabilities to our healthcare systems. The results of this year's HVA will include the four districts that make up the NWHRN healthcare coalition footprint, SW Washington Healthcare Alliance, and the three catchment areas within central and eastern Washington. This provides an ability to assess the results at both a local and state-wide level to determine where certain hazards overlap as a high concern for healthcare regardless of their geographic location.

When looking across the geographic areas, there are several hazards that have been identified as either Extreme or High likelihood and impact for healthcare. These hazards include **Cyber Threat, Health Incident, and either Mass Casualty Attack- Simplex Attack, or Workplace Violence.** Some additional hazards to note that were common across most areas are **Energy Emergency, Severe Weather, Wildfire-Indirect Impact, and Supply Chain.** These hazards should be taken into consideration when looking at state-wide vulnerabilities to healthcare, meaning if one of these hazards were to occur in one or more areas within Washington, they could have a significant impact on healthcare's ability to provide services to the community and would likely have cascading impacts across the healthcare system across multiple jurisdictions.

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Matrix Designation *see matrix key below*	Central District	North District	NW District	West District	Wenatchee Catchment Area	Spokane Catchment Area	Tri-Cities Catchment Area	SW WA Healthcare Alliance
Extreme	CT EE HI MCA-SA	CT HI HE WV	CT EE HI HE SW SC TI	CT F HI HE SW SC	CT WF-II	CT D* HI WFII F* WV	HI	CT F HI
High	EQ-MD HM MCA-CA HE SW SU SC TI WV	MCA-SA EE F SW SC WF-II	WF-II MCA-SA MACA-CA F	EQ-MD EE	WF-DI HI SC* WV	EE WF-DI HM* MCA-SA SW SC TI E-WTRC	CT EE F-S WF-II WV	HM HE LS SW
Medium	EQ-MAD WF-DI RE V F L WF-II	EQ-MAD GE MCA-CA RE V WF-DI EQ-MD HM L SU TI	EQ-MAD T&S V EQ-MD F-S LS WV	DF EQ-MAD MCA-SA MCA-CA V WF-II HM L SU TI	DF EQ-MAD MCA-CA D EQ-MD EE F-S F HE MCA-SA SW TI	DF EQ-MAD F-S MCA-CA SU V RE HE LS	DF DQ-MAD MCA-CA RE F HM SW SC* TI* HE	DF EQ-MAD MCA-SA MCA-CA V EQ-MD EE SU SC TI WF-DI WD-II
Low		DF T&S	DF D HM	F-S T&S WF-DI	A HM LS* SU V	A EQ-MD	MCA-SA SU V* WF-DI*	T&S
Insignificant	DF		WF-DI SU				A D EQ-MD LS	

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Matrix Key

A = Avalanche
CT = Cyber Threat
D = Drought
DF = Dam Failure
E- WTRC= Erosion- Waterways, Tributaries, Rivers, Coastal
EE = Energy Emergency
EQ- MD = Earthquake Minor Damage
EQ-MAD = Earthquake Major Damage
F = Flooding
F-S = Fire- Structure
GE = Geomagnetic Event
HE = Heat- Extreme
HI = Health Incident
HM = Hazardous Materials
LS = Landslide
MCA-CA = Mass Casualty Attack- Complex Attack
MCA-SA = Mass Casualty Attack- Simplex Attack
RE = Radiological Event
SC = Supply Chain
SU = Social Unrest
S**W** = Severe Weather
T & S = Tsunami & Seiches
TI = Transportation Incident
V = Volcano
WF-DI = Wildfire- Direct Impact
WF-II = Wildfire- Indirect Impact
WV = Workplace Violence

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CENTRAL DISTRICT: KING & PIERCE COUNTIES

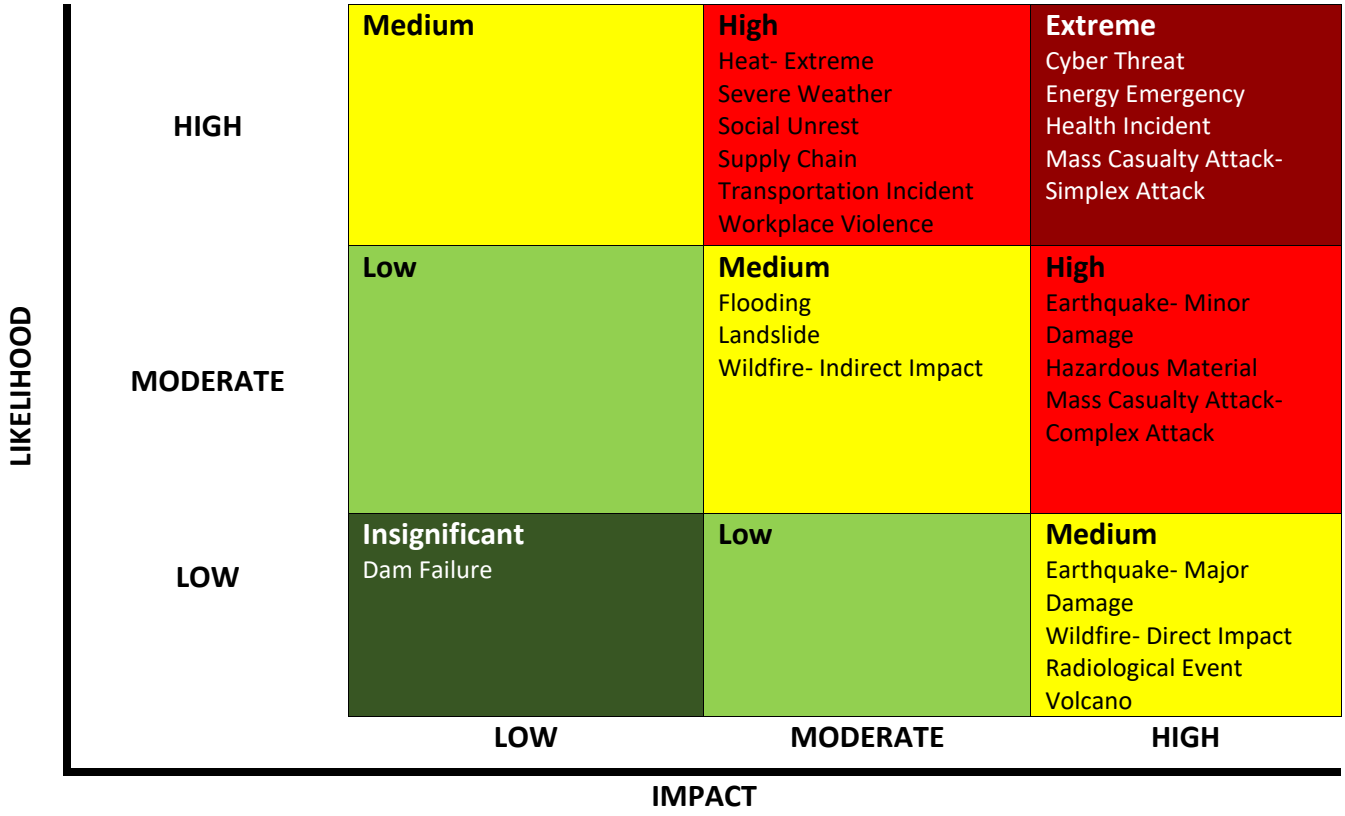
Summary and Demographics

Central District held its focus group on Monday, May 15th, 2023, with a total of 32 individuals participating. Professional backgrounds among individuals included members from Hospitals, Public Health, Outpatient Clinics, Home Health, and Long-Term Care.

Figure 2: Hazard Matrix Results

MATRIX DESIGNATION	HAZARD	MATRIX DEFINITION
Extreme	• Cyber Threat • Energy Emergency • Health Incident • Mass Casualty Attack- Simplex Attack	'High' likelihood and 'High' impact
High	• Earthquake- Minor Damage • Hazardous Materials • Mass Casualty Attack- Complex Attack	'Moderate' likelihood and 'High' impact
	• Heat- Extreme • Severe Weather • Social Unrest • Supply Chain • Transportation Incident • Workplace Violence	'High' likelihood and 'Moderate' impact
Medium	• Earthquake- Major Damage • Wildfire- Direct Impact • Radiological Event • Volcano	'Low' likelihood and 'High' impact
	• Flooding • Landslide • Wildfire- Indirect Impact	'Moderate' likelihood and 'Moderate' impact
Low		'Low' likelihood and 'Moderate' impact
		'Moderate' likelihood and 'Low' impact
Insignificant	• Dam Failure	'Low' likelihood and 'Low' impact

Figure 3: Hazard Risk Matrix



Results and Analysis

Based on the hazard matrix, the most extreme risks to the Central District healthcare systems are Cyber Threat, Energy Emergency, Health Incident, and Mass Casualty Attack- Simplex Attack with a ranking of high likelihood and high impact voted on by the focus group. The hazard matrix also identifies Heat- Extreme, Severe Weather, Social Unrest, Supply Chain, Transportation Incident, Workplace Violence, Earthquake- Minor Damage, Hazardous Material, and Mass Casualty Attack- Complex Attack as high priority risks.

The hazards that changed to a higher ranking include: Energy Emergency, and Mass Casualty Attack- Simplex Attack. Two new hazards were added to the Central District HVA, Workplace Violence and Radiological Event. Workplace Violence was given an initial ranking of high likelihood and moderate impact giving it an overall ranking of High. Radiological Event was given an initial ranking of low likelihood and a high impact giving it an overall ranking of medium.

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NORTH DISTRICT: WHATCOM, SKAGIT, SAN JUAN ISLAND, ISLAND, & SNOHOMISH COUNTIES

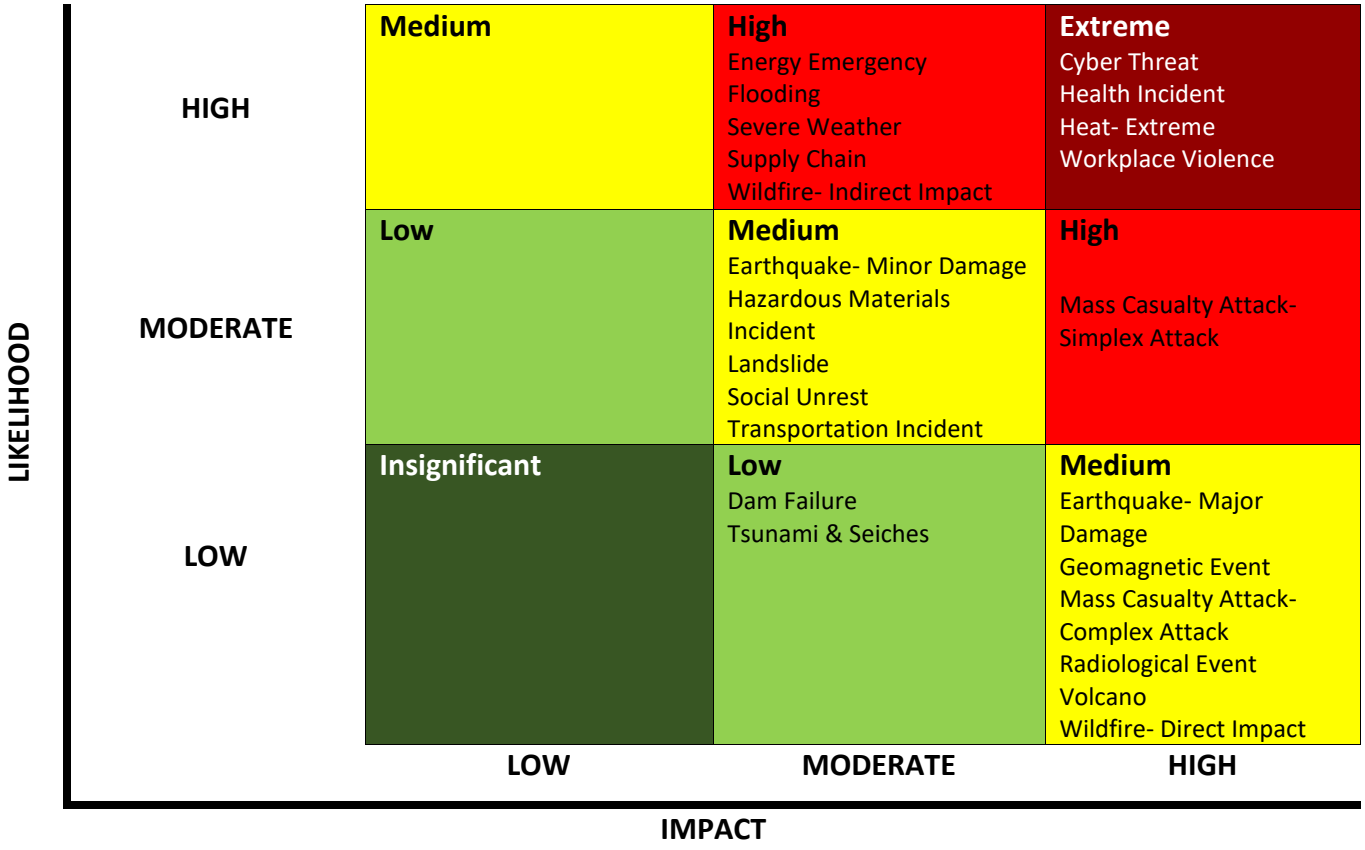
Summary and Demographics

North District held its focus group on Monday, May 19th, 2023, with a total of 45 individuals participating. Professional backgrounds among individuals included members from Hospitals, Public Health, County Emergency Management, Private Ambulance, Outpatient Clinics, Home Health, and Long-Term Care.

Figure 4: Hazard Matrix Results

MATRIX DESIGNATION	HAZARD	MATRIX DEFINITION
Extreme	• Cyber Threat • Health Incident • Heat- Extreme • Workplace Violence	'High' likelihood and 'High' impact
High	• Mass Casualty Attack- Simplex Attack	'Moderate' likelihood and 'High' impact
	• Energy Emergency • Flooding • Severe Weather • Supply Chain • Wildfire- Indirect Impact	'High' likelihood and 'Moderate' impact
Medium	• Earthquake- Major Damage • Geomagnetic Event • Mass Casualty Attack- Complex Attack • Radiological Event • Volcano • Wildfire- Direct Impact	'Low' likelihood and 'High' impact
	• Earthquake- Minor Damage • Hazardous Materials • Landslide • Social Unrest • Transportation Incident	'Moderate' likelihood and 'Moderate' impact
		'High' likelihood and 'Low' impact
Low	• Dam Failure • Tsunami & Seiches	'Low' likelihood and 'Moderate' impact
		'Moderate' likelihood and 'Low' impact
Insignificant		'Low' likelihood and 'Low' impact

Figure 5: Hazard Risk Matrix



Results and Analysis

Based on the hazard matrix, the most extreme risks to the North District healthcare systems are Cyber Threat, Health Incident, Heat- Extreme, and Workplace Violence with a ranking of high likelihood and high impact. The Hazard Matrix also identifies Energy Emergency, Flooding, Severe Weather, Supply Chain, Wildfire- Indirect Impact, and Mass Casualty Attack- Simplex Attack as high priority risks.

The only hazard to increase in ranking was Tsunami & Seiches that went from a low likelihood and low impact to a low likelihood and moderate impact changing the ranking from insignificant to low. There were three hazards that were added to the North District HVA, Workplace Violence, Radiological Event, and Geomagnetic Event. Radiological and Geomagnetic Event both received an initial ranking of low likelihood and high impact putting it in the medium ranking. Workplace Violence was given an initial ranking of high likelihood and high impact putting it in the extreme ranking.

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NORTHWEST DISTRICT: KITSAP, JEFFERSON, & CLALLAM COUNTIES

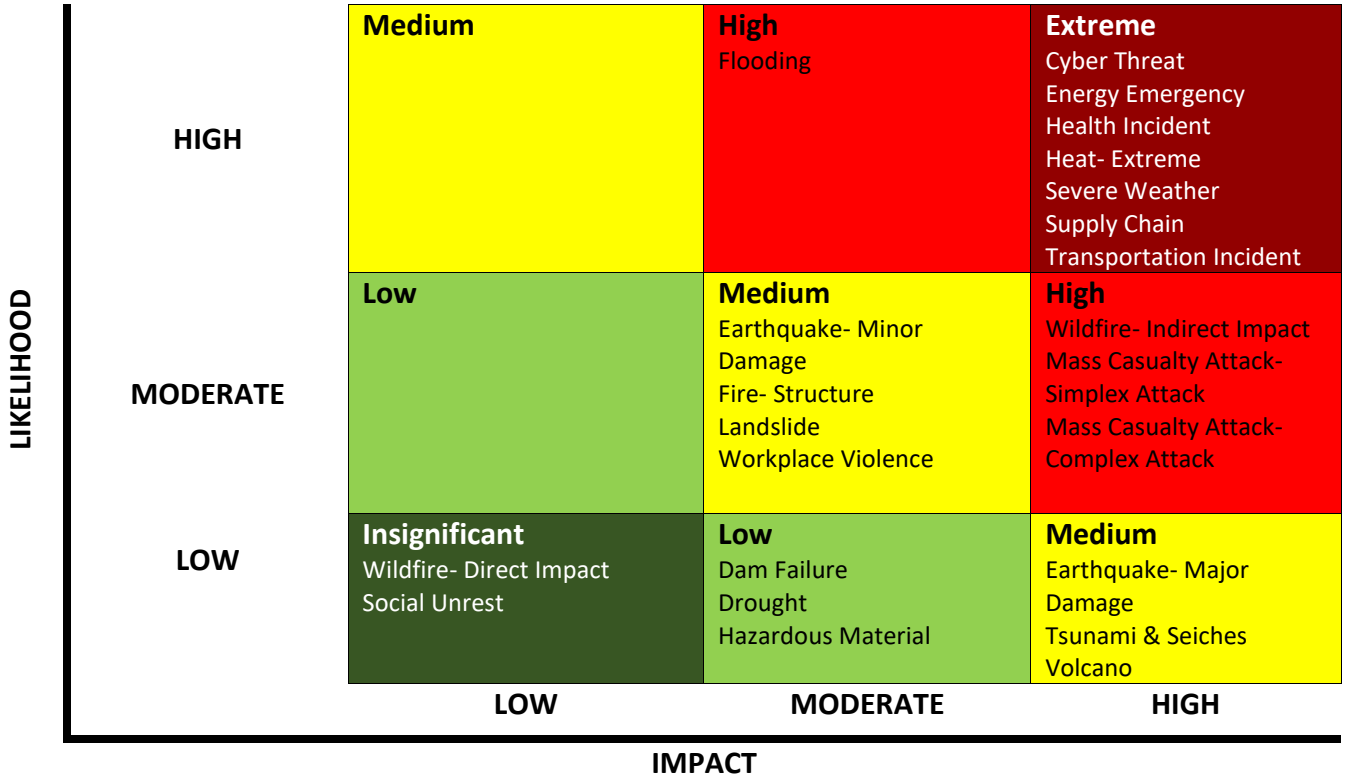
Summary and Demographics

Northwest District held its focus group on Monday, May 12th, 2023, with a total of 25 individuals participating. Professional backgrounds among individuals included members from Hospitals, Public Health, County Emergency Management, Private Ambulance, Outpatient Clinics, Home Health, and Long-Term Care.

Figure 6: Hazard Matrix Results

MATRIX DESIGNATION	HAZARD	MATRIX DEFINITION
Extreme	• Cyber Threat • Energy Emergency • Health Incident • Heat- Extreme • Severe Weather • Supply Chain • Transportation Incident	'High' likelihood and 'High' impact
High	• Wildfire- Indirect Impact • Mass Casualty Attack- Simplex Attack • Mass Casualty Attack- Complex Attack	'Moderate' likelihood and 'High' impact
	• Flooding	'High' likelihood and 'Moderate' impact
Medium	• Earthquake- Major Damage • Tsunami & Seiches • Volcano	'Low' likelihood and 'High' impact
	• Earthquake- Minor Damage • Fire- Structure • Landslide • Workplace Violence	'Moderate' likelihood and 'Moderate' impact
		'High' likelihood and 'Low' impact
Low	• Dam Failure • Drought • Hazardous Material	'Low' likelihood and 'Moderate' impact
		'Moderate' likelihood and 'Low' impact
Insignificant	• Wildfire- Direct Impact • Social Unrest	'Low' likelihood and 'Low' impact

Figure 7: Hazard Risk Matrix



Results and Analysis

Based on the hazard matrix, the most extreme risks to the Northwest District healthcare systems are Cyber Threat, Energy Emergency, Health Incident, Heat- Extreme, Severe Weather, Supply Chain, and Transportation Incident with a ranking of high likelihood and high impact. The Hazard Matrix also identifies Flooding, Wildfire- Indirect Impact, Mass Casualty Attack- Simplex Attack and Mass Casualty Attack- Complex Attack as high priority risks.

Several hazards increased in ranking. Dam Failure was previously ranked as low likelihood and low impact giving it a ranking of insignificant, however this year it was ranked as low likelihood and moderate impact giving it a Low ranking. Tsunami & Seiches was also previously ranked as low likelihood and low impact giving it a ranking of Insignificant, however this year it was ranked as low likelihood but high impact giving it a medium ranking. During the Northwest District HVA, two additional hazards were presented and discussed during the meeting, one was Workplace Violence and the other was Radiological Event. After discussion by the focus group, it was determined that only Workplace Violence would be added as a standalone hazard and was given an initial ranking of moderate likelihood and moderate impact giving it an overall ranking of medium.

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WEST DISTRICT: MASON, THURSTON, LEWIS, PACIFIC, & GRAY'S HARBOR

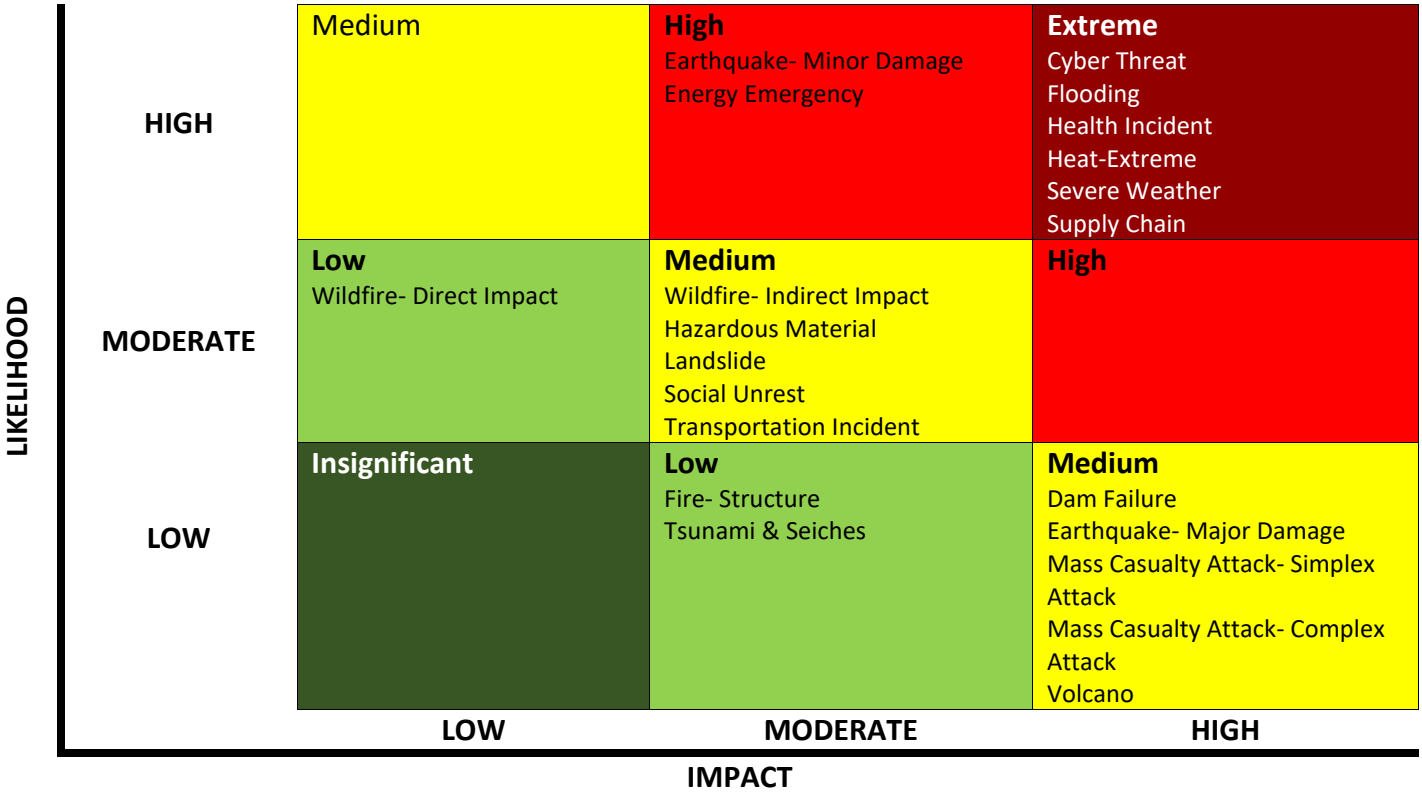
Summary and Demographics

The West District hosted its focus group on Friday May 9th, 2023, with a total of 30 individuals in attendance. The participants came from a variety of different professional backgrounds including Hospitals, Public Health, County Emergency Management, Private Ambulance, Outpatient Clinics, Home Health, and Long-Term Care.

Figure 8: Hazard Matrix Results

MATRIX DESIGNATION	HAZARD	MATRIX DEFINITION
Extreme	• Cyber Threat • Flooding • Health Incident • Heat-Extreme • Severe Weather • Supply Chain	'High' likelihood and 'High' impact
High		'Moderate' likelihood and 'High' impact
	• Earthquake- Minor Damage • Energy Emergency	'High' likelihood and 'Moderate' impact
Medium	• Dam Failure • Earthquake- Major Damage • Mass Casualty Attack- Simplex Attack • Mass Casualty Attack- Complex Attack • Volcano	'Low' likelihood and 'High' impact
	• Wildfire- Indirect Impact • Hazardous Material • Landslide • Social Unrest • Transportation Incident	'Moderate' likelihood and 'Moderate' impact
		'High' likelihood and 'Low' impact
Low	• Fire- Structure • Tsunami & Seiches	'Low' likelihood and 'Moderate' impact
	• Wildfire- Direct Impact	'Moderate' likelihood and 'Low' impact
Insignificant		'Low' likelihood and 'Low' impact

Figure 9: Hazard Risk Matrix



Results and Analysis

Based on the Hazard Matrix, the most extreme risks to the West District healthcare systems are Cyber Threat, Flooding, Health Incident, Heat- Extreme, Severe Weather, and Supply Chain with a ranking of high likelihood and high impact. The Hazard Matrix also identifies Earthquake- Minor Damage, and Energy Emergency as high priority risks.

One hazard increased in ranking, fire-structure which went from low likelihood and low impact to a low likelihood and a moderate impact giving it a new ranking of low. No new hazards were introduced during the west district meeting this year, however next year the new hazards that were presented and voted on at other meetings will be introduced and participants of the focus group will be given an opportunity to vote on whether they want them added and if so, how they would rank them.

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SOUTHWEST WASHINGTON HEALTHCARE ALLIANCE: CLARK, COWLITZ, SKAMANIA, WAHKIAKUM, AND KLICKITAT COUNTIES

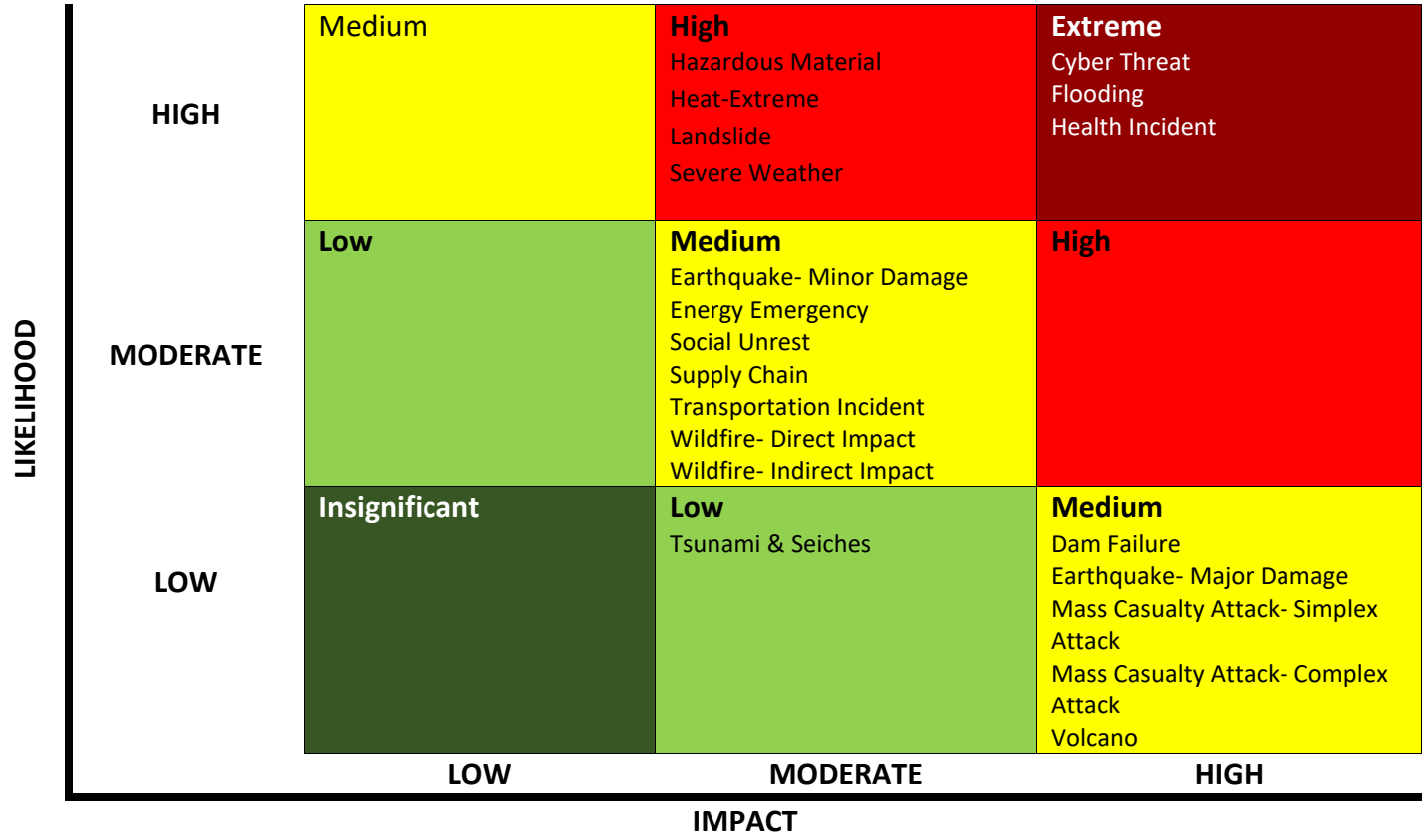
Summary and Demographics

The Southwest Washington Healthcare Alliance hosted its focus group on May 3rd, 2023, with a total of 23 individuals in attendance. The participants came from a variety of different professional backgrounds including Hospitals, Public Health, County Emergency Management, Outpatient Clinics, Home Health, and Long-Term Care.

Figure 10: Hazard Matrix Results

MATRIX DESIGNATION	HAZARD	MATRIX DEFINITION
Extreme	• Cyber Threat • Flooding • Health Incident	'High' likelihood and 'High' impact
High		'Moderate' likelihood and 'High' impact
	• Hazardous Material • Heat-Extreme • Landslide • Severe Weather	'High' likelihood and 'Moderate' impact
Medium	• Dam Failure • Earthquake- Major Damage • Mass Casualty Attack- Simplex Attack • Mass Casualty Attack- Complex Attack • Volcano	'Low' likelihood and 'High' impact
	• Earthquake- Minor Damage • Energy Emergency • Social Unrest • Supply Chain • Transportation Incident • Wildfire- Direct Impact • Wildfire- Indirect Impact	'Moderate' likelihood and 'Moderate' impact
		'High' likelihood and 'Low' impact
Low	• Tsunami & Seiches	'Low' likelihood and 'Moderate' impact
		'Moderate' likelihood and 'Low' impact
Insignificant		'Low' likelihood and 'Low' impact

Figure 11: Hazard Risk Matrix



Results and Analysis

Based on the Hazard Matrix, the most extreme risks to the Southwest WA Healthcare Alliance healthcare systems are Cyber Threat, Flooding, and Health Incident with a ranking of high likelihood and high impact. The Hazard Matrix also identifies Hazardous Material, Heat- Extreme, Landslide, and Severe Weather as high priority risks.

Several Hazards increased in ranking including Tsunami & Seiches and Transportation Incident. Tsunami & Seiches went from low likelihood and low impact and an Insignificant ranking to a low likelihood and moderate impact giving it Low ranking. Transportation Incident went from a moderate likelihood and low impact and overall low ranking to a moderate likelihood and moderate impact giving it an overall medium ranking. No new hazards were introduced this year, however next year the new hazards that were presented and voted on at other meetings will be introduced and participants of the focus group will be given an opportunity to vote on whether they want them added and if so, how they would rank them.

NORTHWEST HEALTHCARE Response Network.

WENATCHEE CATCHMENT AREA: CHELAN, GRANT, DOUGLAS, KITTITAS, OKANOGAN COUNTIES

Summary and Demographics

The Wenatchee Catchment area hosted its focus group on June 5th, 2023, with a total of 10 individuals in attendance. The participants came from a variety of different professional backgrounds including Hospitals, Public Health, County Emergency Management, Outpatient Clinics, Home Health, and Long-Term Care.

Figure 12: Hazard Matrix Results

MATRIX DESIGNATION	HAZARD	MATRIX DEFINITION
Extreme	• Cyber Threat • Wildfire- Indirect Impact	'High' likelihood and 'High' impact
High	• Wildfire- Direct Impact • Health Incident • Supply Chain* • Workplace Violence	'Moderate' likelihood and 'High' impact
		'High' likelihood and 'Moderate' impact
Medium	• Dam Failure • Earthquake- Major Damage • Mass Casualty Attack- Complex Attack	'Low' likelihood and 'High' impact
	• Drought • Earthquake- Minor Damage • Energy Emergency • Fire- Structure • Flooding • Heat- Extreme • Mass Casualty Attack- Simplex Attack • Severe Weather • Transportation Incident	'Moderate' likelihood and 'Moderate' impact
		'High' likelihood and 'Low' impact
Low	• Avalanche • Hazardous Material • Landslide* • Social Unrest • Volcano	'Low' likelihood and 'Moderate' impact
		'Moderate' likelihood and 'Low' impact
Insignificant		'Low' likelihood and 'Low' impact

Figure 13: Hazard Risk Matrix

LIKELIHOOD	LOW	MODERATE	HIGH
HIGH	Medium	**High**	**Extreme** Cyber Threat Wildfire- Indirect Impact
MODERATE	**Low**	**Medium** Drought Earthquake- Minor Damage Energy Emergency Fire- Structure Flooding Heat- Extreme Mass Casualty Attack- Simplex Attack Severe Weather Transportation Incident	**High** Wildfire- Direct Impact Health Incident Supply Chain* Workplace Violence
LOW	**Insignificant**	**Low** Avalanche Hazardous Material Landslide* Social Unrest Volcano	**Medium** Dam Failure Earthquake- Major Damage Mass Casualty Attack- Complex Attack

IMPACT

Results and Analysis

Based on the hazard matrix, the most extreme risks to the Wenatchee Catchment healthcare systems are Cyber Threat and Wildfire- Indirect Impact with a ranking of high likelihood and high impact. The hazard matrix also identifies Wildfire- Direct Impact, Health Incident, Supply Chain and Workplace Violence as high priority risks.

This is the first year NWHRN conducted the healthcare HVA for partners in central and eastern Washington and for that reason there is not a comparative analysis on hazards that may have been previously ranked differently. The Wenatchee Catchment focus group did, however, have an opportunity to vote on whether to include both Workplace Violence and Radiological Event into the Wenatchee HVA. The result of the voting was to include Workplace Violence as a standalone hazard, but not Radiological Event. Workplace Violence was given a ranking of moderate likelihood and high impact giving it an overall ranking of high.

NORTHWEST HEALTHCARE Response Network.

SPOKANE CATCHMENT AREA: SPOKANE, STEVENS, WHITMAN, ADAMS, PEND ORIELLE, ASOTIN, LINCOLN, FERRY GARFIELD, & COLUMBIA COUNTIES

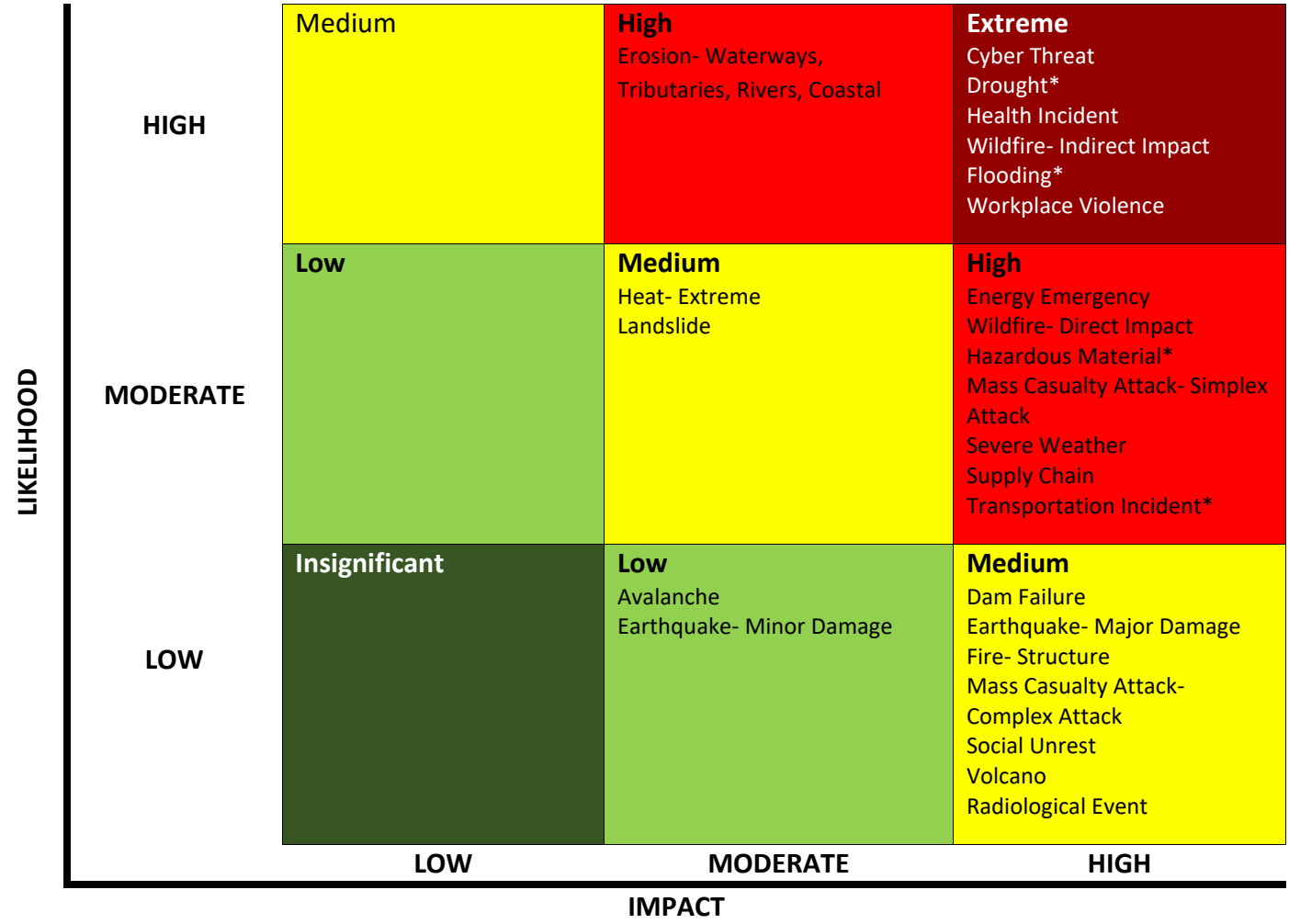
Summary and Demographics

The Spokane Catchment area hosted its focus group on June 6th, 2023, with a total of 11 individuals in attendance. The participants came from a variety of different professional backgrounds including Hospitals, Public Health, County Emergency Management, Outpatient Clinics, Home Health, and Long-Term Care.

Figure 14: Hazard Matrix Results

MATRIX DESIGNATION	HAZARD	MATRIX DEFINITION
Extreme	• Cyber Threat • Drought* • Health Incident • Wildfire- Indirect Impact • Flooding* • Workplace Violence	'High' likelihood and 'High' impact
High	• Energy Emergency • Wildfire- Direct Impact • Hazardous Material* • Mass Casualty Attack- Simplex Attack • Severe Weather • Supply Chain • Transportation Incident*	'Moderate' likelihood and 'High' impact
	• Erosion- Waterways, Tributaries, Rivers, Coastal	'High' likelihood and 'Moderate' impact
Medium	• Dam Failure • Earthquake- Major Damage • Fire- Structure • Mass Casualty Attack- Complex Attack • Social Unrest • Volcano • Radiological Event	'Low' likelihood and 'High' impact
	• Heat- Extreme • Landslide	'Moderate' likelihood and 'Moderate' impact
		'High' likelihood and 'Low' impact
Low	• Avalanche • Earthquake- Minor Damage	'Low' likelihood and 'Moderate' impact
		'Moderate' likelihood and 'Low' impact
Insignificant		'Low' likelihood and 'Low' impact

Figure 15: Hazard Risk Matrix



Results and Analysis

Based on the hazard matrix, the most extreme risks to the Spokane Catchment healthcare systems are Cyber Threat, Drought, Health Incident, Wildfire- Indirect Impact, Flooding, and Workplace Violence with a ranking of high likelihood and high impact. The Hazard Matrix also identifies Erosion- Waterways, Tributaries, Rivers, Coastal, Energy Emergency, Wildfire- Direct Impact, Hazardous Material, Mass Casualty Attack- Simplex Attack, Severe Weather, Supply Chain, and Transportation incident as high priority risks.

This is the first year NWHRN conducted the Healthcare HVA for partners in Central and Eastern Washington and for that reason there is not a comparative analysis on hazards that may have been previously ranked differently. The Spokane Catchment focus group did have an opportunity to vote to add Workplace Violence and Radiological Event into the Spokane HVA. Workplace Violence was ranked high likelihood and high impact giving it an overall ranking of Extreme. Radiological Event was given low likelihood and a high impact giving it an overall ranking of medium.

NORTHWEST HEALTHCARE Response Network.

TRI-CITIES CATCHMENT AREA: YAKIMA, BENTON, FRANKLIN, & WALLA WALLA COUNTIES

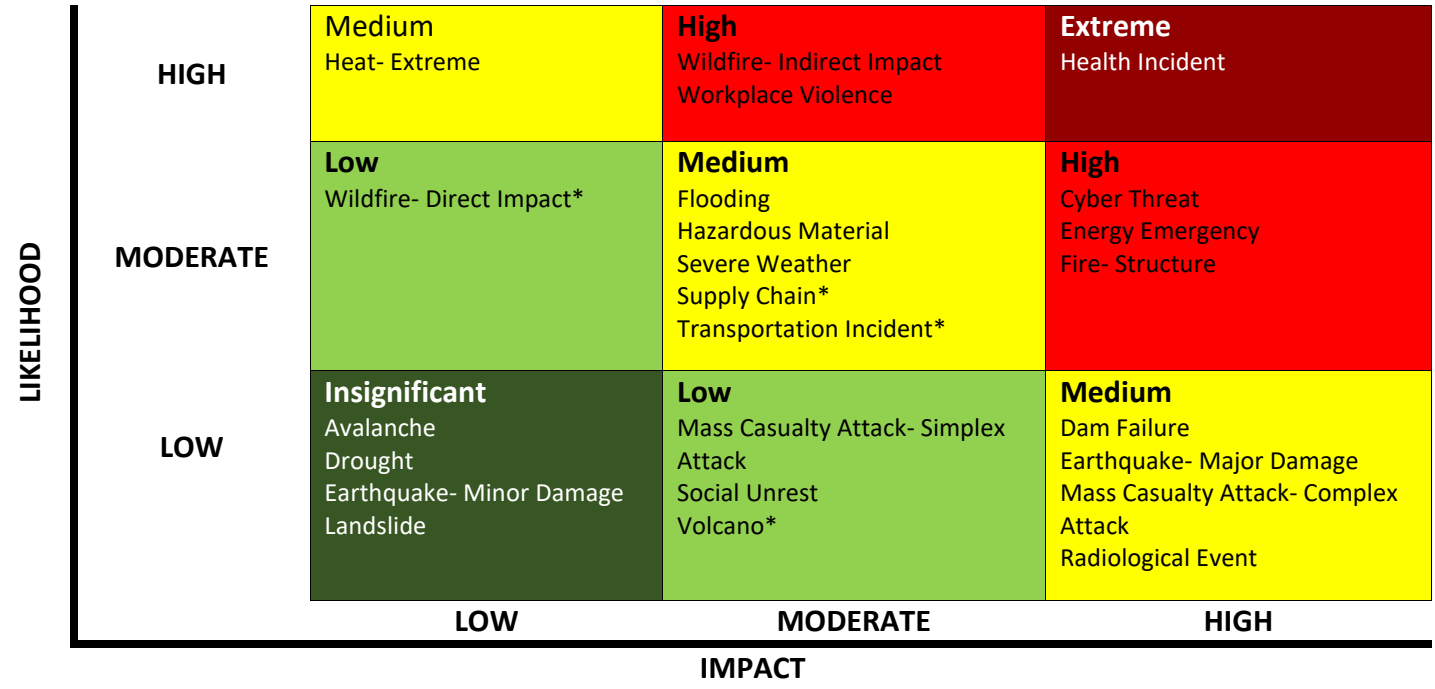
Summary and Demographics

The Tri-Cities Catchment area hosted its focus group on June 7th, 2023, with a total of 23 individuals in attendance. The participants came from a variety of different professional backgrounds including Hospitals, Public Health, County Emergency Management, Outpatient Clinics, Home Health, and Long-Term Care.

Figure 14: Hazard Matrix Results

MATRIX DESIGNATION	HAZARD	MATRIX DEFINITION
Extreme	• Health Incident	'High' likelihood and 'High' impact
High	• Cyber Threat • Energy Emergency • Fire- Structure	'Moderate' likelihood and 'High' impact
	• Wildfire- Indirect Impact • Workplace Violence	'High' likelihood and 'Moderate' impact
Medium	• Dam Failure • Earthquake- Major Damage • Mass Casualty Attack- Complex Attack • Radiological Event	'Low' likelihood and 'High' impact
	• Flooding • Hazardous Material • Severe Weather • Supply Chain* • Transportation Incident*	'Moderate' likelihood and 'Moderate' impact
	• Heat- Extreme	'High' likelihood and 'Low' impact
Low	• Mass Casualty Attack- Simplex Attack • Social Unrest • Volcano*	'Low' likelihood and 'Moderate' impact
	• Wildfire- Direct Impact*	'Moderate' likelihood and 'Low' impact
Insignificant	• Avalanche • Drought • Earthquake- Minor Damage • Landslide	'Low' likelihood and 'Low' impact

Figure 17: Hazard Risk Matrix



Results and Analysis

Based on the hazard matrix, the most extreme risks to the Tri-Cities Catchment healthcare systems are Health Incident with a ranking of high likelihood and high impact. The Hazard Matrix also identifies Wildfire- Indirect Impact, Workplace Violence, Cyber Threat, Energy Emergency, and Fire- Structure as high priority risks.

This is the first year NWHRN conducted the Healthcare HVA for partners in Central and Eastern Washington and for that reason there is not a comparative analysis on hazards that may have been previously ranked differently. The Tri-Cities Catchment focus group did have an opportunity to vote to add Workplace Violence and Radiological Event into the Tri-Cities HVA. Workplace Violence was ranked high likelihood and moderate impact giving it an overall ranking of High. Radiological Event was given low likelihood and a high impact giving it an overall ranking of medium.

CONCLUSIONS AND FUTURE WORK

This state-wide report represents an update of the 2023-2024 HVA assessment. The HVA results can be interpreted from a state and regional or local level and will help guide and prioritize planning and response efforts across Washington state.

The NWHRN plans to continue to work with the Southwest Washington Healthcare Alliance to support the HVA within their service area. Additionally, the Healthcare Hazard Vulnerability Assessment for central and eastern Washington catchment areas will continue to be conducted by NWHRN. The healthcare HVA will to be reviewed annually and our partners will have an opportunity to assess all the hazards to ensure our report accurately depicts the vulnerabilities across our healthcare systems.

The HVA process will continue to be refined and updated based on participant feedback and internal review.

NORTHWEST HEALTHCARE Response Network.

Appendix 1: NWHRN District Hazard Matrix

Matrix Design	Central District	North District	Northwest District	West District
Extreme	Cyber Threat Energy Emergency Health Incident Mass Casualty Attack-Simplex Attack	Cyber Threat Health Incident Heat- Extreme Workplace Violence	Cyber Threat Energy Emergency Health Incident Heat- Extreme Severe Weather Supply Chain Transportation Incident	Cyber Threat Flooding Health Incident Heat-Extreme Severe Weather Supply Chain
High	Earthquake- Minor Damage Hazardous Material Mass Casualty Attack-Complex Attack Heat- Extreme Severe Weather Social Unrest Supply Chain Transportation Incident Workplace Violence	Mass Casualty Attack-Simplex Attack Energy Emergency Flooding Severe Weather Supply Chain Wildfire- Indirect Impact	Wildfire- Indirect Impact Mass Casualty Attack-Simplex Attack Mass Casualty Attack-Complex Attack Flooding	Earthquake- Minor Damage Energy Emergency
Medium	Earthquake- Major Damage Wildfire- Direct Impact Radiological Event Volcano Flooding Landslide Wildfire- Indirect Impact	Earthquake- Major Damage Geomagnetic Event Mass Casualty Attack-Complex Attack Radiological Event Volcano Wildfire- Direct Impact Earthquake- Minor Damage Hazardous Materials Landslide Social Unrest Transportation Incident	Earthquake- Major Damage Tsunami & Seiches Volcano Earthquake- Minor Damage Fire- Structure Landslide Workplace Violence	Dam Failure Earthquake- Major Damage Mass Casualty Attack-Simplex Attack Mass Casualty Attack-Complex Attack Volcano Wildfire- Indirect Impact Hazardous Material Landslide Social Unrest Transportation Incident
Low		Dam Failure Tsunami and Seiches	Dam Failure Drought Hazardous Material	Fire- Structure Tsunami & Seiches Wildfire- Direct Impact
Insignificant	Dam Failure		Wildfire- Direct Impact Social Unrest	

NORTHWEST HEALTHCARE Response Network.

Appendix 2: Central and Eastern WA Catchment Hazard Matrix

Matrix Designation	Wenatchee Catchment Area	Spokane Catchment Area	Tri-Cities Catchment Area
Extreme	Cyber Threat Wildfire- Indirect Impact	Cyber Threat Drought* Health Incident Wildfire- Indirect Impact Flooding* Workplace Violence	Health Incident
High	Wildfire- Direct Impact Health Incident Supply Chain* Workplace Violence	Energy Emergency Wildfire- Direct Impact Hazardous Material* Mass Casualty Attack-Simplex Attack Severe Weather Supply Chain Transportation Incident* Erosion- Waterways, Tributaries, Rivers, Coastal	Cyber Threat Energy Emergency Fire- Structure Wildfire- Indirect Impact Workplace Violence
Medium	Dam Failure Earthquake- Major Damage Mass Casualty Attack-Complex Attack Drought Earthquake- Minor Damage Energy Emergency Fire- Structure Flooding Heat- Extreme Mass Casualty Attack-Simplex Attack Severe Weather Transportation Incident	Dam Failure Earthquake- Major Damage Fire- Structure Mass Casualty Attack-Complex Attack Social Unrest Volcano Radiological Event Heat-Extreme Landslide	Dam Failure Earthquake- Major Damage Mass Casualty Attack-Complex Attack Radiological Event Flooding Hazardous Material Severe Weather Supply Chain* Transportation Incident* Heat- Extreme
Low	Avalanche Hazardous Material Landslide* Social Unrest Volcano	Avalanche Earthquake- Minor Damage	Mass Casualty Attack-Simplex Attack Social Unrest Volcano* Wildfire- Direct Impact*
Insignificant			Avalanche Drought Earthquake- Minor Damage Landslide

NORTHWEST HEALTHCARE Response Network.

Appendix 3: Southwest Washington Healthcare Alliance

Matrix Designation	SW WA Healthcare Alliance
Extreme	Cyber Threat Flooding Health Incident
High	Hazardous Material Heat-Extreme Landslide Severe Weather
Medium	Dam Failure Earthquake- Major Damage Mass Casualty Attack- Simplex Attack Mass Casualty Attack- Complex Attack Volcano Earthquake- Minor Damage Energy Emergency Social Unrest Supply Chain Transportation Incident Wildfire- Direct Impact Wildfire- Indirect Impact
Low	Tsunami & Seiches
Insignificant	