

ASPR TRACIE Evaluation of Hazard Vulnerability Assessment Tools

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The Assistant Secretary for Preparedness and Response (ASPR) Technical Resources, Assistance Center, Information Exchange (TRACIE) Evaluation of Hazard Vulnerability Assessment Tools provides a comparison chart showing the similarities and differences among several of the primary and other sample hazard vulnerability tools used by public health and healthcare organizations, and the Federal Emergency Management Agency's (FEMA) Threat and Hazard Identification Risk Assessment (THIRA). Each description includes a summary of its primary use/purpose; as well as information on who developed the tool and how; the format of the tool; a basic overview of the calculations approach; and the benefits and limitations of the tool.

Healthcare and public health organizations use a variety of hazard vulnerability assessment (HVA) tools that are most useful to their

facility/jurisdiction. The outcomes of the HVA should then be used during the development of a jurisdictional risk assessment (JRA). The JRA can come in a variety of forms, including the THIRA. Regardless of the type of tool used, HVAs and JRAs (including the THIRA) all assess risk based on the identification of threats and/or hazards and assign a level or severity of risk. However, the THIRA is primarily focused on emergency management and disaster response at the jurisdictional level, and asks states, territories, tribes, local areas, insular areas, and the Urban Area Security Initiatives (UASI) grant recipients to perform their respective threat and hazard identification risk assessments (which should take into account HVAs developed by the key stakeholders within the jurisdiction).

Therefore, there may be an entirely different assessment of risk in the jurisdictional THIRA than what may be assigned at the hospital or public health level. There will be similarities in the identification of common hazards across the various assessments; however, the THIRA may result in a higher level of risk assessment than the HVA for the health sector entities.

It is also important to note that public health and healthcare are often expected to use the data used in the JRA for their respective HVAs. Risk assessment is a collaborative process among partners and the various HVAs should inform each other.

ASPR TRACIE also has a [Hazard Vulnerability/Risk Assessment Topic Collection](#) that clarifies the differences between these assessments and provides additional examples and templates.

Assessment Tool Name	Intended Audience/ Applied Sector	Use/Purpose	Development of Tool	Format	Calculations Approach	Benefits	Limitations
Pennsylvania Public Health Risk Assessment Tool (PHRAT)	Jurisdictions, public health system	<ul style="list-style-type: none"> To provide an analysis of the health-related impacts of various hazards that can occur in a jurisdiction, and help prioritize planning efforts for those emergencies. 	<ul style="list-style-type: none"> Developed by the Drexel University School of Public Health (contracted by the Pennsylvania Department of Health). Based on adaptations of other existing resources: University of California, Los Angeles' (UCLA) Hazard Risk Assessment Instrument (HRAI) and Kaiser Permanente's Hazard Vulnerability Analysis (HVA) Tool. 	Workbook developed in Microsoft Excel.	<ul style="list-style-type: none"> Generates an estimate of hazard-specific risk, based on probability and impact severity identified for each hazard. Severity is measured in five major domains: human health, healthcare services, inpatient healthcare infrastructure, and community health and public health services. Generates "adjusted risk," which incorporates an assessment of the additional planning required to reduce a hazard's impact on at-risk populations. A Preparedness Score is generated using the jurisdiction's current capacity in each of the 15 Public Health Preparedness capabilities and 8 Healthcare System Preparedness capabilities. 	<p>Common Features</p> <ul style="list-style-type: none"> Guide and step-by-step instructions provided. Helps establish planning priorities. Jurisdiction-specific analysis using automated calculations. Identifies hazards that pose the greatest risk to a jurisdiction. Identifies jurisdictional gaps in public health and healthcare preparedness. Simple implementation, yet comprehensive assessment. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Addresses at-risk populations. Analysis incorporates baseline data entered by user. Available for customization through the Pennsylvania Department of Health. 	<ul style="list-style-type: none"> Public health-specific. Data may be skewed if entered from multiple sources or by various users.
Health Hazard Assessment and Prioritization (hHAP)	Jurisdictions, public health system	<ul style="list-style-type: none"> To assess and prioritize planning and mitigation efforts for the most important hazards (in Southern California). <ul style="list-style-type: none"> Although the tool is focused on hazards in Southern California, it is designed to be flexible and adaptive, and applicable to other health jurisdictions and numerous potential hazards. To offer a health-focused mechanism to engage the community, identify organizational priorities, and improve an agency's or community's capability to successfully prepare for, respond to, and recover from potential emergency threats. Provides a six-step hazard vulnerability assessment process. 	<ul style="list-style-type: none"> Developed by the Los Angeles Department of Public Health—in collaboration with the Orange County Health Care Agency, the Long Beach Department of Health and Human Services, and the Pasadena Department of Public Health. Based on adaptations of other existing resources: UCLA's HRAI and Kaiser Permanente's HVA Tool. 	Workbook developed in Microsoft Excel.	<ul style="list-style-type: none"> Identifies, ranks, and prioritizes the health and medical impacts of potential hazards relevant to a specific jurisdiction/agency based on user-provided input (scores). Focuses on the relative perceived risk, expressed through a relationship and interaction of several Risk Components: probability of hazard occurrence, health severity of the hazard (potential for increase in morbidity, hospitalizations and mortality), impact (consequences) of hazard on health and medical systems and the community, and the protective value of existing response and community preparedness resources. <ul style="list-style-type: none"> Each Risk Component has a corresponding metric input for each associated hazard. 	<p>Common Features</p> <ul style="list-style-type: none"> Guide and step-by-step instructions provided. Helps establish planning priorities. Jurisdiction-specific analysis using automated calculations. Identifies hazards that pose the greatest risk to a jurisdiction. Identifies jurisdictional gaps in public health and healthcare preparedness. Simple implementation, yet comprehensive assessment. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Flexible and adaptive for use by other jurisdictions. <ul style="list-style-type: none"> Tool can be applied to any potential hazard identified by the jurisdiction. Pre-loaded tool includes 62 scenario-based hazards. User can add/delete hazards. Tool can average responses from multiple users. Requires responses from various response partners in addition to public health and healthcare partners. Includes mental health system impact in risk assessments. 	<ul style="list-style-type: none"> Does not incorporate baseline data. Does not address at-risk populations.

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UCLA Hazard Risk Assessment Instrument (HRAI)	Public health agencies (state and local)	<ul style="list-style-type: none"> To provide guidance in determining the likelihood of a hazard occurring, assess community vulnerabilities and current resources, and prioritize resources in planning for disasters. Key hazards are identified and their potential consequences are estimated. 	<ul style="list-style-type: none"> Developed by the UCLA Center for Public Health and Disasters. Is based on the expertise of the authors and incorporates disaster-related data in order to illustrate its systematic methodology. 	Worksheets provided as appendices.	<ul style="list-style-type: none"> Consists of four steps: probability of mishap, severity of consequences, scoring of the consequences, and risk analysis. 	<p>Common Features</p> <ul style="list-style-type: none"> Guide and step-by-step instructions provided. Helps establish planning priorities. Identifies hazards that pose the greatest risk to a jurisdiction. Identifies jurisdictional gaps in public health and healthcare preparedness. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Analysis incorporates baseline data on the community's everyday health status entered by user. 	<ul style="list-style-type: none"> Public health-specific. Developed in 2006. Tool is provided as a PDF only. Cannot easily enter data or manipulate tool. Does not automatically generate calculations or graphs/charts. Does not address at-risk populations.
Kaiser Permanente Hazard Vulnerability Analysis (HVA) Tool	Hospitals and healthcare facilities	<ul style="list-style-type: none"> To identify hazards, through a systematic approach, that may affect demand for hospital services or its ability to provide those services. 	<ul style="list-style-type: none"> Developed by Kaiser Permanente. 	Workbook developed in Microsoft Excel.	<ul style="list-style-type: none"> The tool takes inputs from the facility's HVA group on the probability and impact of threats, and mitigation and preparedness measures the facility has taken to determine a level of risk for each hazard. The risks associated with each hazard can be analyzed and used to prioritize planning, mitigation, response, and recovery activities. 	<p>Common Features</p> <ul style="list-style-type: none"> Helps establish planning priorities. Identifies hazards that pose the greatest risk to a facility. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Pre-loaded tool includes 61 scenario-based hazards. 2017 version of tool incorporates data from real-world emergency alerts and activations to inform probability and risk calculations. 	<ul style="list-style-type: none"> Hospital and healthcare facility-specific. Does not provide a guidance manual. Instructions on tool are not comprehensive. Does not incorporate baseline data. Does not address at-risk populations.
Community Hazard Vulnerability Assessment (CHVA)	Healthcare facilities, jurisdictions, emergency management, public health agencies (state and local)	<ul style="list-style-type: none"> To provide comprehensive analysis of the health, property, and business-related impacts of various hazards that can occur within a jurisdiction or to a healthcare facility. Results can be used to focus finite resources. To help prioritize planning efforts for those emergencies. To provide a mechanism for external partners to rate the event based off of the four phases of emergency management. To illustrate operational and regulatory impact of events. To align efforts in emergency management and operational continuity. 	<ul style="list-style-type: none"> Developed by Children's Hospital Colorado, in collaboration with a Wisconsin workgroup consisting of state and local emergency management and public health departments, tribal health and hospital emergency planners. Based on adaptations of other existing resources: Kaiser Permanente's HVA Tool. 	Workbook developed in Microsoft Excel.	<ul style="list-style-type: none"> Assesses risk based on probability of occurrence; probability of a facility needing to respond to the hazard; human, property, and business impact; and readiness assessments based on the 4 phases of emergency management. The tool allows the user to evaluate events three different ways: Relative Risk based on Occurrence, Relative Risk based on the likelihood of facility Response, or an absolute number to rank risk (Non-weighted). <ul style="list-style-type: none"> It is up to the user to determine which rating scale or a combination thereof, they will use. (The non-weighted risk removes the weighting scale but provides a larger range of numbers). 	<p>Common Features</p> <ul style="list-style-type: none"> Helps establish planning priorities. Identifies hazards that pose the greatest risk to a facility or community. Identifies jurisdictional gaps in public health and healthcare preparedness. Includes explanation of tool components and directions for using the tool. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Incorporates the four phases of emergency management and takes an all hazards approach to address national and local planning scenarios. Fully customizable for use by other organizations and industries (e.g., schools) based on specific needs. Includes 120 events for comprehensiveness (however, not all need to be used). Extra "preprogrammed" event lines are available in each section. Includes data input columns for both Occurrence and Response for more precise calculations; the justification being that just because an event occurs does not mean the facility has to respond. Includes a Non-Weighted Risk column for facilities that 	<ul style="list-style-type: none"> Does not address at-risk populations. Does not incorporate baseline data.

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Comprehensive Preparedness Guide 201: Threat and Hazard Identification and Risk Assessment (THIRA) and Stakeholder Preparedness Review (SPR) Guide (Third edition, May 2018)	Jurisdictions, emergency management	<ul style="list-style-type: none"> To support the conduct of a THIRA as described in the third edition of the Comprehensive Preparedness Guide (CPG) 201: Threat and Hazard Identification and Risk Assessment and Stakeholder Preparedness Review (SPR) Guide. <ul style="list-style-type: none"> Note: The First Edition of the CPG (April 2012) and associated toolkit described a standard process for identifying community-specific threats and hazards and setting capability targets for each core capability identified in the National Preparedness Goal as required in Presidential Policy Directive (PPD) 8: National Preparedness. The CPG 201: Threat and Hazard Identification and Risk Assessment Guide (Second Edition) expands the THIRA process to include estimation of resources needed to meet the capability targets. 	<ul style="list-style-type: none"> Developed by FEMA. Builds on existing local, state, tribal, and territorial hazard identification risk assessments. 	PDF document contains detailed directions, best practices, and examples for each step, including calculations.	<ul style="list-style-type: none"> The third edition provides a three-step approach for conducting a THIRA: identify the threats and hazards of concern, give the threats and hazards context, and establish capability targets. The SPR builds off the capability targets from the THIRA, and has three steps: assess capabilities; identify and address gaps; and describe impacts of funding sources. 	<p>Common Features</p> <ul style="list-style-type: none"> Helps establish planning priorities. Allows jurisdictions to estimate impacts from threats and hazards to the community across the 32 core capabilities and 5 mission areas (prevention, protection, mitigation, response, and recovery). <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Allows jurisdictions to identify a community's capability targets, current capabilities, and capability gaps to address identified risks. 	<ul style="list-style-type: none"> Emergency management-specific. This is a guidance document, not an actual tool to enter data into. Does not automatically generate calculations or graphs/charts. Does not provide a template for the format of the completed THIRA/SRP. Does not address at-risk populations.
Region 9 Healthcare Coalition (Washington State) Community Hazard Vulnerability Assessment Tool	Healthcare coalitions	<ul style="list-style-type: none"> To evaluate vulnerability to specific hazards and address anticipated and unanticipated risks that may affect coalition members in the region. The assessment focuses on the input of healthcare partners as the core group to provide a regional healthcare outlook on hazards. 	<ul style="list-style-type: none"> Developed by the Region 9 Healthcare Coalition in Washington State. Adapted from the Arizona Coalition for Healthcare Emergency Response's (AzCHER) Community Hazard Vulnerability Assessment (CHVA) tool, which Region 9 HCC used to prioritize and weigh hazards. <ul style="list-style-type: none"> The Arizona CHVA is based on the Children's Hospital Colorado CHVA. 	PDF. May request Excel file from Region 9 HCC.	<ul style="list-style-type: none"> Assesses risk based on probability of occurrence; probability of the region needing to respond to the hazard; healthcare impact; and readiness assessments based on the 4 phases of emergency management. The tool allows the user to evaluate events three different ways: Relative Risk based on Occurrence, Relative Risk based on the likelihood of facility Response, or an absolute number to rank risk (Non-weighted). <ul style="list-style-type: none"> It is up to the user to determine which rating scale or a combination thereof, they will use. (The non-weighted risk removes the weighting scale but provides a larger range of numbers). 	<p>Common Features</p> <ul style="list-style-type: none"> Helps establish planning priorities. Identifies hazards that pose the greatest risk to coalition members at a regional level. Identifies regional gaps in healthcare preparedness. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Incorporates the four phases of emergency management and takes an all hazards approach to address planning scenarios at the regional level. Includes data input columns for both Occurrence and Response for more precise calculations; the justification being that just because an event occurs does not mean the facility has to respond. Includes a Non-Weighted Risk column for organizations that do not like a percentage based rating. 	<ul style="list-style-type: none"> Healthcare-specific. Tool does not address at-risk populations (though the HVA protocol does note that social vulnerability data should be considered when developing plans). Scoring criteria and instructions for using the tool are incomplete in the PDF document. Does not incorporate baseline data.



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Midlands Regional HVA 2017	Healthcare coalitions	<ul style="list-style-type: none"> To identify the hazards that the healthcare coalition may need to respond to. 	<ul style="list-style-type: none"> Developed by the Midlands Healthcare Coalition (South Carolina). Based on the Kaiser Permanente HVA. 	PDF. May request Excel file from ASPR TRACIE.	<ul style="list-style-type: none"> Users enter data to estimate probability and impact of threats, and mitigation and preparedness measures the coalition has taken to determine a relative level of risk for each hazard. 	<p>Common Features</p> <ul style="list-style-type: none"> Helps establish planning priorities. Identifies hazards that pose the greatest risk to coalition members at a regional level. Identifies regional gaps in healthcare preparedness. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Clearly defined consensus-based scoring criteria are included with the tool. 	<ul style="list-style-type: none"> Healthcare-specific. Tool does not address at-risk populations. Does not provide a guidance manual. Instructions on tool are not comprehensive. Does not incorporate baseline data.
The Florida Public Health Risk Assessment Tool (FPHRAT)	Public health agencies (state, regional, and local)	<ul style="list-style-type: none"> To create jurisdictional risk assessments by assessing the 15 Centers for Disease Control and Prevention (CDC) Preparedness Capabilities and local resources; producing gap analyses; estimating the impacts of hazards to public health, healthcare, and mental health; measuring the positive effect of mitigation factors such as community resilience; and producing a final matrix of residual risk. 	<ul style="list-style-type: none"> Developed by local, regional, and state partners within the state of Florida. 	Online tool.	<ul style="list-style-type: none"> Users enter data on capability assessments and status of resources needed for response and recovery. The tool calculates a Hazard Risk Index score for each hazard by considering the probability of occurrence; medical and social vulnerability scores; and public health impact, healthcare impact, and behavioral health impact. The tool also calculates a Residual Risk Index that takes mitigation factors into account (capability and resource data entered by user and pre-populated community resilience data). 	<p>Common Features</p> <ul style="list-style-type: none"> Helps establish planning priorities. Identifies hazards that pose the greatest risk to a community. Identifies jurisdictional gaps in public health and healthcare preparedness. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Tool contains pre-filled hazard information for 36 hazards most likely to have public health impact in Florida. Probability, vulnerability scores, health impact scores, and resilience scores are pre-populated in the tool, as determined by subject matter experts. Analysis incorporates capability and resource assessment data entered by user. Custom reports can be built by the user, in addition to the standard charts and graphs generated by the tool. Highly detailed directions and explanation of data sources and calculations used. 	<ul style="list-style-type: none"> The tool's pre-populated data are specific to the state of Florida, though the tool may be used as a model for other jurisdictions wanting to create something similar.
Big Bend Healthcare Coalition (Florida) Hazard Vulnerability Analysis (HVA) Risk Assessment Tool	Healthcare facilities	<ul style="list-style-type: none"> To provide information for assessing vulnerabilities and needs, and for determining emergency management program priorities that ensure the most important hazards, including highly probable and/or major healthcare impacts, are planned for first, and those least likely to occur or have minor/moderate public impact can be deferred until later. 	<ul style="list-style-type: none"> Developed by the Big Bend Healthcare Coalition in Florida. Based on the Kaiser Permanente tool; the UCLA HRAI and the Los Angeles Department of Public Health hHAP. 	Available in Microsoft Word and as a workbook in Microsoft Excel.	<ul style="list-style-type: none"> Relative Risk Score (% of threat) is calculated based on probability that each hazard may occur within a 5-year planning window, and severity (inverse relationship between potential impact, and status of mitigation activities) 	<p>Common Features</p> <ul style="list-style-type: none"> Helps establish planning priorities. Identifies hazards that pose the greatest risk to a facility. Identifies gaps in coalition preparedness. Includes detailed scoring criteria and directions for the tool. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Addresses at-risk populations. Pre-loaded tool includes 48 hazards. 	<ul style="list-style-type: none"> Does not incorporate baseline data.

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General Public Health Community Risk Assessment	Local public health agencies	<ul style="list-style-type: none"> To identify and understand the potential disasters and hazards that may impact a community's public health, so that decisions can be made regarding which hazards require attention and what actions must be planned for to protect the community's people, property, and environment. 	<ul style="list-style-type: none"> Developed by the University of Iowa and the Iowa Department of Public Health. Based on existing hazard and vulnerability assessment tools, such as the Kaiser Permanente HVA tool and the UCLA Center for Public Health and Disaster HRAI. 	Online tool set up within a Learning Management System. NOTE: Requires free registration.	<ul style="list-style-type: none"> Risk calculations are based on the probability of each hazard's occurrence, its potential human, infrastructure, and community impact, and the mitigating effects of preparedness and training. 	<p>Common Features</p> <ul style="list-style-type: none"> Helps establish planning priorities. Identifies hazards that pose the greatest risk to a community. Identifies jurisdictional gaps in public health preparedness. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Users log data online, one hazard at a time. The tool contains 37 pre-populated hazards, and users can skip those that do not apply. 	<ul style="list-style-type: none"> Does not address at-risk populations. Can only be accessed through a Learning Management System account.
General Healthcare Community Risk Assessment	Healthcare facilities	<ul style="list-style-type: none"> To identify and understand the potential disasters and hazards for the community in which a healthcare facility is located so that decisions can be made regarding which hazards require attention and what actions must be planned for to protect the people, property, and environment of that facility. 	<ul style="list-style-type: none"> Developed by the University of Iowa and the Iowa Department of Public Health. Based on existing hazard and vulnerability assessment tools, such as the Kaiser Permanente HVA tool and the UCLA Center for Public Health and Disaster HRAI. 	Online tool set up within a Learning Management System. NOTE: Requires free registration.	<ul style="list-style-type: none"> Risk calculations are based on the probability of each hazard's occurrence, its potential human, property, and business impact, and the effect of mitigation factors, including preparedness, training, internal resources, and external resources. Risk scores for each hazard are relative to each other. 	<p>Common Features</p> <ul style="list-style-type: none"> Helps establish planning priorities. Identifies hazards that pose the greatest risk to a facility. Generates charts/graphs to analyze hazards relative to each other. <p>Additional/Unique Features</p> <ul style="list-style-type: none"> Users log data online, one hazard at a time. The tool contains 45 pre-populated hazards, and users can skip those that do not apply. 	<ul style="list-style-type: none"> Does not address at-risk populations. Can only be accessed through a Learning Management System account.