SAN BERNARDINO COUNTY

Public Health
Preparedness and Response

Jurisdictional Risk Assessment (JRA) Report

2025

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Executive Summary

On November 1, 2024, the San Bernardino County Department of Public Health (SBCDPH) Preparedness and Response Program (PRP) began distributing SBCDPH's Jurisdictional Risk Assessment (JRA) to assess the health and medical risk to San Bernardino County from potential hazards. The assessment aimed to inform SBCDPH preparedness efforts in developing emergency response plans for the next five years. The survey was conducted with participants from various sectors including public health, healthcare, emergency management, fire, law, government, tribal, educational, private, community- and faith-based organizations from November 1 to December 20, 2024. A total of 253 participants throughout the county responded to the survey. Participants were first asked to assign points based on their perceived level of hazard impact on Human Health and Healthcare System categories. The participants were then presented with a list of 39 hazards and asked to rank them from the most to least likely to happen within the next five years. After collecting responses from survey participants and incorporating hazard impact variables from different hazard scenarios, it was found that the top five hazards in the county were earthquake, electrical failure, wildland fires, extreme heat events, and bioterrorism. Additionally, risk scores were further stratified to three main respondent groupings: SBCDPH (27), healthcare (89), and non-healthcare representatives (137). It was found that four of the top five hazards identified (earthquake, electrical failure, wildland fires, and extreme heat events) were ranked in the top five for each group's stratified analysis results, thus highlighting that participants were mostly aligned in their views of the highest risk hazards. Whole community planning considerations for priority populations, and further discussions of JRA results with key stakeholders will take place to inform the development of SBCDPH's Multiyear Integrated Preparedness Plan (MYIPP).

Introduction

SBCDPH's jurisdictional risk assessment (JRA) was developed for public health emergency preparedness, response, and recovery planning and serves as a structured evaluation of potential threats, vulnerabilities, and response capacities within San Bernardino County. The risk assessment process is a foundational component of emergency preparedness that ensures public health risks and threats specific to a jurisdiction (i.e. infectious disease outbreaks, environmental hazards, and bioterrorism) are identified and integrated into emergency planning efforts. Additionally, the risk assessment process examines existing vulnerabilities within public health and emergency response systems; thus, ensuring that gaps in resources, personnel, and capabilities are addressed to enhance overall preparedness. By prioritizing risks, the assessment optimizes resource allocation, ensuring that medical supplies, emergency personnel, and funding are strategically distributed. The risk assessment process requires partnerships

with healthcare coalitions, emergency management agencies, governmental sectors, community-based organizations, and private industry partners to ensure a comprehensive assessment while also fostering collaboration needed for an effective and coordinated response.

The risk assessment is a key function of the mitigation and preparedness phases of the emergency management cycle (Figure 1).

Figure 1. The Emergency Management

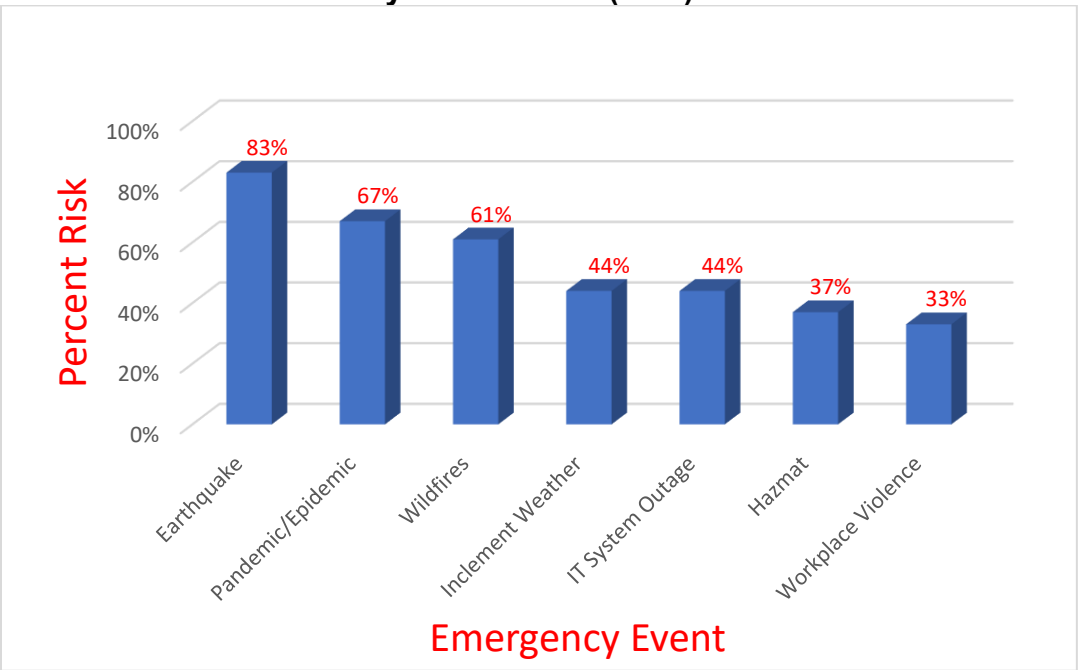
During the mitigation phase, the risk assessment process helps jurisdictions identify and analyze potential hazards, assess vulnerabilities, and implement strategies to reduce risk before an emergency occurs. In the prevention phase, the risk assessment will inform the prioritization of actions needed to prevent disasters and emergencies from occurring (e.g. education on hazards, enforcement, testing, etc.). In the preparedness phase, the risk assessment informs planning efforts, resource allocation, trainings, and exercises so that identified risks are addressed effectively. Additionally, the risk assessment supports response and recovery efforts by guiding decision-making during and after an incident. By systematically evaluating jurisdictional risks and capacities, this assessment serves as an essential tool for ensuring evidence-based decision-making, mitigating the impact of public health emergencies, and enhancing prevention and preparedness activities.

As a requirement of the 2024-2028 Centers for Disease Control and Prevention (CDC) Public Health Emergency Preparedness (PHEP) grant[1], the SBCDPH PRP Program, which is PHEP-funded and receives additional Cities Readiness Initiative (CRI) funding, must submit a risk assessment that reflects the County's unique vulnerabilities and capabilities. The results of the JRA will be used to inform and guide the Integrated Preparedness Planning Workshop (IPPW), which establishes a structured approach to planning drills and exercises through the development of a Multiyear Integrated Preparedness Plan (MYIPP). The MYIPP will serve as a living document that aligns preparedness priorities with a progressive exercise program. Through these efforts, San Bernardino County will strengthen its ability to respond and recover from public health emergencies while maintaining compliance with federal grant requirements.

Background

San Bernardino County has also conducted two other risk assessments in recent years. A Hazard Vulnerability Assessment (HVA) was conducted by the Inland Counties Emergency Medical Agency (ICEMA) in 2024 with 15 general acute care hospitals, which receives Healthcare Preparedness Program (HPP) funding. The following hazards were identified from highest to lowest: earthquake, pandemic/epidemic, wildfires, inclement weather, communication/information system outage, hazardous materials (HazMat), and workplace violence (Figure 2.) The HVA is conducted on an annual basis to meet grant requirements[1].

Figure 2. Hospital Preparedness Program Coalition Hazard Vulnerability Assessment (HVA) 2023-2024 Results



In addition, a risk assessment was conducted for the 2022 San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP)[2] and consisted of three components: 1) hazard identification; 2) a review of hazard profiles including historic occurrences and an assessment of the potential for future events, and 3) a vulnerability assessment based on potential losses or impacts to buildings. This risk assessment is conducted once every 36 months (along with a supplemental Stakeholder Preparedness Review each year) to meet MJHMP funding requirements. The MJHMP Planning Team, which was composed of emergency management agency representatives, determined that the county and its special districts would focus its efforts on hazards that rated within the high and medium "Probability" and "Impact" categories (Figure 3). Based on these criteria, the following top hazards were identified: wildfire, flood, earthquake/geological hazard, drought, terrorism, climate change, and landslide.

Figure 3. San Bernardino County's Multi-jurisdictional Hazard Mitigation Plan (MJHMP) Risk Assessment Results

RATING	HAZARD RANKING CRITERIA
HIGH	An event is imminent and/or experts have confirmed potential for major losses.
MEDIUM	An event is possible and/or potential for occurrence is assumed but not verified.
LOW	An event is unlikely and/or no historical context exists.

		IMPACT		
		HIGH	MEDIUM	LOW
PROBABILITY	HIGH	• Wildfire • Flood • Earthquake/ Geological Hazards	• Drought	
	MEDIUM	• Terrorism	• Climate Change • Landslide	• Hail • Infestation • Extreme Heat
	LOW		• Dam Inundation	• Tornado • High Winds • Winter Storms • Lightning • Extreme Cold

Recognizing the limitations of these risk assessments, SBCDPH conducted its own JRA to ensure appropriate and diverse representation of various organizations (e.g. community-based/faith-based organizations, tribes, and a broader range of emergency response partners and healthcare facilities) and to better prioritize and identify hazards with public health impacts for future planning.

Methodology

To develop SBCDPH's JRA, PRP met with Los Angeles County Department of Public Health Emergency Preparedness and Response Division to discuss their survey instrument and methodology for their recent JRA. Due to the proximity and similar hazards between the Counties, their JRA model was adopted and tailored to San Bernardino County.

The tailored JRA survey was distributed through email and in-person meetings with emergency partners throughout the county. To identify hazards and priorities from a diverse range of sectors, the survey was provided to a variety of partners including

healthcare (i.e. skilled nursing facilities, long-term care facilities, dialysis centers, clinics, and hospitals), emergency management organizations, schools, law and fire departments, tribal nations, mental/behavioral organizations, faith-based and community-based organizations, and other County agencies. It was also shared with other SBCDPH program leadership, who were invited to share the survey with their partners across the county. Communications regarding the survey were also shared through PRP's partner distribution list. Updates on current JRA progress were provided approximately twice a month along with reminders to complete it. PRP also conducted four presentations and four "office hours" style meetings throughout November to provide support to the participants completing the survey. Finally, phone outreach was conducted to certain sectors (e.g. dialysis centers) with a campaign to remind individuals to complete the survey in the final weeks before its closing.

The JRA (Attachment A) was split into three main sections: the "Introduction/Background", "Hazard Impacts", and "Hazard Likelihood" sections. In the "Introduction/Background" section, participants were asked to identify their organization type (by sector). Due to the county's diverse geographic regions, each affected differently by various hazards, participants were also asked to specify the regions their organizations served. In this survey, the regions were defined as follows:

- *Desert:* This region includes cities and communities (e.g. Barstow, Needles, Twentynine Palms) in the eastern part of the county, characterized by desert landscapes such as the Mojave Desert.
- *Mountain:* This region covers the northern and eastern parts of the county, including the San Bernardino Mountains and portions of the National Forest. Communities like Big Bear Lake, Lake Arrowhead, and Crestline are in this region.
- *Inland Valley:* This region encompasses the southwestern portion of the county, including the valley areas, suburban communities, and cities like Ontario, Rancho Cucamonga, Fontana, and San Bernardino.
- *High Desert:* This region includes cities and towns (e.g. Victorville, Apple Valley, Hesperia, and Adelanto) in the northern and central parts of the county at higher elevations.
- *All of San Bernardino County Regions (All Regions):* Includes all regions outlined above.

In the "Hazard Impacts" section of the survey, participants assigned points (out of 100) to the Human Health and Healthcare System categories and subcategories to reflect their relative importance in determining risk, where the higher the score, the higher the perceived importance of that category in determining risk. The "Hazard Likelihood" section, was structured so that the ranking of hazards was more manageable for

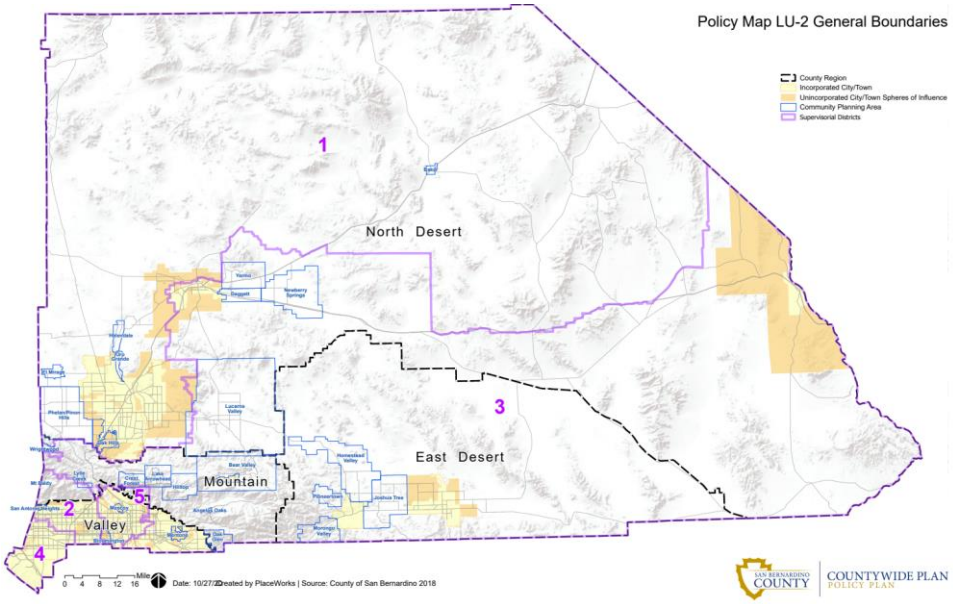
participants. They were first asked to categorize the 39 hazards into three categories (i.e., Most Likely, Likely, and Least Likely). The participants then determined a ranking for every hazard within each categorical group based on the likelihood or probability of the hazards occurring in the county over the next five years. The 39 hazards in this survey were selected based on past real-world events, such as severe winter storms and wildland fires, and included hazards that were rare or less likely to occur, such as avalanches and volcanic eruptions.

The risk assessment was also reviewed by the SBCDPH's Health Equity (HE) program for whole community planning considerations as well as the National Weather Service for feedback on identified hazards. Initial efforts were made to establish a "health equity" impact factor to account for high-priority populations during the risk assessment in collaboration with the HE program. However, it was ultimately decided to incorporate health equity into planning considerations and the development of the MYIPP (see "Whole Community Planning" in the Discussions section).

Jurisdictional Risk Profile

San Bernardino County is located in the southern part of California and is the largest county in the contiguous United States by area, covering approximately 20,105 square miles. It is divided into four main areas including the Valley, Mountain, East Desert, and North Desert regions and is bordered by Los Angeles (west), Riverside (south), Kern and Mono (north) Counties as well as Arizona and Nevada along its eastern border (Figure 4). There are 24 incorporated cities, unincorporated lands, as well as land designated for federal and military use.

Figure 4. San Bernardino County General Boundaries[3]



Demographics[4]

According to the 2020 Census, San Bernardino County has an estimated population of 2,181,654, making it the fifth most populous county in California. Of the population, 55.9% are Hispanic or Latino, 24.5% are White Non-Hispanic, 9.4% are Black Non-Hispanic, 9.3% are Asian, 3.8% are two or more races, 2.2% are American Indian and Alaska Native, and 0.5% are Native Hawaiian and Other Pacific Islander.

The median age is 34.9 years, slightly younger than the California median age of 38.2. About 6.2% of the population is under 5 years and 25.2% of the population is under 18 years old. Approximately 12.9% of the population is 65 years and older. In San Bernardino County, 45.7% speak a language other than English at home, including Spanish (36.9%), Asian and Pacific Islander languages (5.8%), other Indo-European languages (1.9%), and other languages (1.2%).

In the county, 11.9% of the population has a disability, including hearing difficulty (3.1%), vision difficulty (2.7%), cognitive difficulty (5.3%), ambulatory difficulty (6.3%), self-care difficulty (2.8%), and independent living difficulty (6.0%). Additionally, of the 11.9% of the population that has a disability, 8.3% are also under 65 years of age.

Social Determinants of Health[5]

The California Healthy Places Index (HPI), developed by the Public Health Alliance of Southern California, is a tool used to calculate and explore the conditions and structures that impact life expectancy. The overall HPI combines the characteristics of healthcare, housing, education, and other important social determinants of health to calculate a score that shows how healthy a community is in comparison to the rest of the state. The HPI estimated for San Bernardino County is in the 25.0 percentile, meaning that the county has community conditions that are healthier than 25% of other California counties.

According to U.S. Census, the median household income in the county is $85,069, lower than the median household income in California ($95,521). About 13.1% of the population in the county are estimated to live in poverty. When categorized by age, 17.5% of individuals under 18 live in poverty, compared to 11.6% of those aged 18 to 64 and 11.9% of those aged 65 and older. The county also has 23.6% of the population with a bachelor's degree or higher, 97.1% of high school enrollment for children aged 15-17, and 38.9% of preschool enrollment for children aged 3 to 4 years.

About 8.1% of the population does not have healthcare coverage, slightly higher than 6.4% of CA's population without healthcare coverage. About 95.2% of the population has automobile access.

According to the annual 2024 Point-in-Time count[6] conducted by San Bernardino County Office of Homeless Servies, there are 1,200 sheltered and 3,055 unsheltered homeless individuals in the county, for a total of 4,255 homeless individuals. From the CA HPI, the

county has healthier housing conditions than 19.6% of other counties in the state. This is derived from the percentage of homeownership (59.8%), housing habitability (99.0%), low-income homeowner severe housing cost burden (27.2%), and uncrowded housing (91.2%).

Healthcare Infrastructure

San Bernardino County is home to more than 700 long-term care facilities (LTCFs), 54 Skilled Nursing Facilities (SNFs), 40+ dialysis centers, primary care clinics, specialty care clinics, home health agencies, hospice services, and 36 prehospital EMS providers. Additionally, SBCDPH operates four Federally Qualified Health Centers (FQHCs) in Adelanto, Hesperia, Ontario, and San Bernardino, offering a range of services including dental, primary care, pediatric, reproductive, maternal, and HIV care. There are 18 general acute care hospitals, one Veterans Affairs hospital and two United States Department of Defense (DoD) hospitals in the county. The Loma Linda Veterans Administration Hospital is in Loma Linda; the DoD's Weed Army Community Hospital is in Fort Irwin, while the Robert E. Bush Naval Hospital is in 29 Palms. Additionally, the Riverside-San Bernardino County Indian Health, Inc. operates two clinics within the County (i.e. San Manuel in Grand Terrace and Barstow Health Clinics), that serves Native American tribes in both Riverside and San Bernardino Counties.

Environmental Factors

San Bernardino County has climate hazards related to pollution, extreme heat, and wildfire risk.

The CalEnviroScreen 4.0 tool[7] was created and used by the Office of Environmental Health Hazard Assessment within the California Environmental Protection Agency (CalEPA). The purpose of the tool is to calculate the population's vulnerability to environmental pollutants. The environmental pollutants include PM2.5, diesel particulate matter, traffic impacts, toxic releases from facilities, lead risk, and other pollutants. As of 2022, the CalEnviroScreen 4.0 average percentile for the county is 61.2 and the state's average percentile is 50, indicating there is a higher burden of population-pollution interaction in the county compared to the state overall.

According to the California Healthy Places Index: Extreme Heat Edition, the county has 134.6 projected number of days above 90 degrees Fahrenheit in the upcoming mid-century (2035-2064). This is much greater than the projected state median of 79.9 days above 90 degrees. Additionally, there are differences in the extreme heat's impact in the county. The CalEPA Urban Heat Island Index (UHII) is the sum of 182-day temperature differences (degree-hr) between urban and rural reference areas. CalEPA has calculated that the county has an Urban Heat Island Index of 27,100 degree-hr, greater than the state UHII of 8,950 degree-hr[8].

The U.S. Drought Monitor[9] indicates that the county has primarily moderate (43.7%), severe (26.4%), extreme (25.7%), and exceptional (4.2%) drought areas. The higher temperature changes and drought susceptibility lead to an increased risk of wildfires in the county. According to the California Department of Forestry and Fire Protection (Cal FIRE) and the 2010 U.S. Census Bureau, around 7.1% or 145,333 residents of the county's population live in high wildfire risk areas[10,11]. Because this data is from the previous census population estimates, it is an underestimation as the county's population has increased in the last 15 years[12].

Analysis

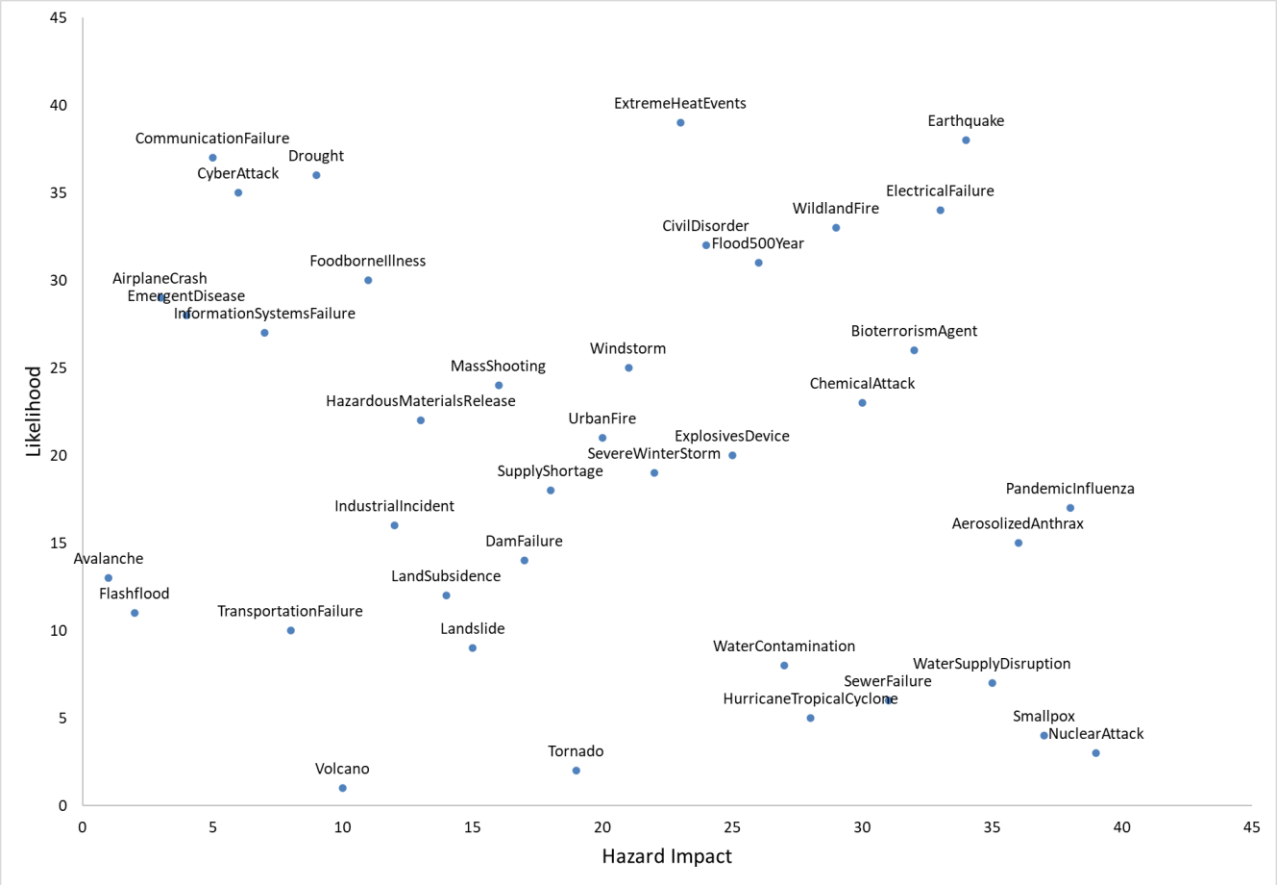
Following the survey's closure, the data was cleaned and processed for analysis. Duplicate and incomplete survey responses were removed, which led to the removal of 128 responses for a final total of 253 complete survey submissions. The large decrease was primarily due to incomplete responses in the final "Hazard Likelihood" section of the survey.

In the "Hazard Impacts" section, participants assigned a total of 100 points to each Impact category. To adjust for the varying levels of impact that each hazard has on each category, baseline hazard impact scores were calculated for the county. Baseline hazard impact variables for the 39 hazard scenarios were derived from research on comparable historical events, published scientific models, and data from similar incidents in other comparable locations. The risk assessment also used Los Angeles County's Risk Assessment, Mapping, and Planning (RAMP) tool to measure an estimate of the mental health impacts of the hazards listed in the assessment[13]. These scenarios were then adjusted to account for the population size of the county and translated to a value function-adjusted hazard score. The California Department of Finance County Population Projections was used to estimate population and was applied to impact estimates[14]. This score was then multiplied with the weight scores that participants assigned to each impact category. The median of all hazard impact scores from each of the 253 participants is the overall hazard impact score and is the x-axis of the scatterplot (Figure 5).

In the survey design, the hazards were grouped according to likelihood. Points were assigned to each group to account for the different levels of likelihood and to rank the overall list of hazards accordingly. The ranking responses were then added up overall by hazard and ranked by lowest to highest ranking where the higher ranking indicated lower likelihood, and the lower ranking indicated higher likelihood (i.e. rank one indicates the highest likelihood). The hazards that were ranked as a higher likelihood were then given a higher score and those ranked lower were given a lower score. The overall likelihood score is the y-axis of the scatterplot (Figure 5). The likelihood scores then received a new ranking score for the overall score calculation. This same median of all hazard impact

scores was then used to calculate the final risk score by multiplying the hazard impact score with the likelihood score. The final risk scores for each hazard were then ranked from highest score to lowest score and the top five were chosen as the hazard priorities.

Figure 5. Jurisdictional Risk Assessment Scatterplot Results



Results

Hazard Priorities – Overall Participants

The top five hazards identified were earthquake, electrical failure, wildland fire, extreme heat events, and bioterrorism agent. The top five hazards are the prioritized risks and will be used in the development of the MYIPP. Levels (i.e. high, medium, and low) for "Likelihood" and "Impact" for each prioritized risk were based on participants assigned points and rankings in the JRA.

Prioritized Risk 1: Earthquake

Likelihood: High
Impact: High

Earthquakes are defined as a sudden shaking of the ground caused by tectonic movements, which can lead to structural damage, casualties, and severe public health consequences. Earthquakes cause immediate injuries, fatalities, and disruptions to medical services, while damaged water systems, overcrowded shelters, and poor sanitation heighten the risk of infectious diseases. Depending on the severity of the earthquake, healthcare systems may become overwhelmed due to infrastructure damage and strained medical staffing resources. Survivors face mental health challenges such as post-traumatic stress disorder (PTSD), anxiety, and depression, along with long-term disruptions in chronic disease management and other healthcare services. Environmental hazards, including toxic exposure and secondary disasters like landslides, further exacerbate health risks.

San Bernardino County has experienced earthquakes in the past with magnitudes higher than 4.0, including a 7.1 magnitude earthquake near Ridgecrest, which impacted the incorporated community of Trona in San Bernardino County (July 2019). There are several fault lines throughout the county including the San Jacinto Fault and the San Andreas Fault. The San Andreas Faultline is of particular concern due to its fault placement in the Inland Valley area of the county where there is more population density[15]. Due to past earthquakes and the likelihood of the “Big One” occurring within the next 30 years, earthquakes were ranked higher and have a larger weight in impact scoring. In combining both scores to calculate risk, it was found that earthquakes continue to be identified as the highest prioritized risk in the county.

Prioritized Risk 2: Electrical Failure

Likelihood: High
Impact: High

Electrical failure is defined as an interruption or malfunction in electrical systems, which can affect power supply and essential services. This can pose significant public health risks, particularly during extreme weather events, by causing heat- or cold-related illnesses due to disruptions in temperature regulating systems. Power outages can also lead to food spoilage, which increases the risk of foodborne illness, as well as disruptions of sanitation systems, which can result in water contamination and the spread of infectious disease. Prolonged failures in hot or cold environments may cause heatstroke, hypothermia, and other temperature-related illnesses. Medical facilities, including hospitals and emergency services, may experience critical disruptions that compromise patient care and life-saving equipment. Additionally, priority populations, such as the elderly or those with chronic health conditions, face increased risks due to lack of access to necessary medical devices or refrigeration of medications.

The likelihood of an electrical failure in San Bernardino County has increased over the years due to a number of factors including aging infrastructure, grid demand, and the

region's susceptibility to extreme weather and environmental conditions that increase the likelihood of wildfires (i.e. high winds, dry vegetation, low humidity, and extreme heat events.) Furthermore, as the threat of wildfires in California has increased, Southern California Edison (SCE) has implemented the Public Safety Power Shutoff (PSPS), in which SCE temporarily shuts off power to its customers to prevent electric systems from becoming a source of ignition. In January 2025, San Bernardino County experienced a Red Flag Warning and a High Wind Advisory, which resulted in over 30,000 customers without power during multiple PSPS throughout the county[16]. This event highlights the increased need to plan for the hazard over the next few years.

Prioritized Risk 3: Wildland Fire

Likelihood: High
Impact: Medium

Wildland fire is defined as a fire occurring in natural landscapes such as forests or grasslands, often exacerbated by dry conditions and high winds. Wildland fires primarily threaten wildlife, however expansion of housing into other high fire risk areas of the county, such as the mountains, has caused an increased risk to residents. Moreover, wildland fires present substantial public health consequences, including loss of life and property, damage to natural resources and agriculture, and deterioration of air quality, which can lead to increased respiratory and cardiovascular conditions. Wildland fires also heighten the risk of flooding, landslides, and erosion, particularly during rainy seasons. In addition to the more immediate impacts of physical injuries and long-term mental health impacts, disruptions to water and sanitation systems and congregate housing during emergency sheltering increase the likelihood of infectious disease outbreaks. Animal care services would be a major consideration for SBCDPH in sheltering activities as a result of evacuations and loss of property. When wildland fires are difficult to control, they can lead to significant damage to property as seen in the Los Angeles Fires (January 2025).

Figure 6. History of Significant Wildland Fires in San Bernardino County[17]

Date	Name	Acres Burned
11/24/1980	Panorama Fire	23,600
10/21/2003	Grand Prix	59,448
10/25/2003	Old Fire	91,281
6/17/2015	Lake Fire	31,359
7/17/2015	North Fire	4,250
8/7/2016	Pilot Fire	8,110
8/16/2016	Blue Cut	37,000
7/31/2020	Apple Fire	33,424
9/5/2020	El Dorado Fire	22,744
9/5/2024	Line Fire	43,978
9/8/2024	Bridge Fire	56,030

San Bernardino County has experienced wildland fires in the past due to its high temperatures, low humidity, and low precipitation during the summer (Figure 6). The Santa Ana winds have historically arrived in the middle of October to the end of November,

however with climate change, the consistent weather patterns have extended Red Flag conditions into other months of the year.

Prioritized Risk 4: Extreme Heat Events

Likelihood: High
Impact: Medium

Extreme heat events (EHEs)—periods of unusually high temperatures—pose significant health risks and strain infrastructure. The primary threat to public health arises from the increasing frequency, intensity, and duration of these events. Heatwaves can cause heat-related illnesses, such as heatstroke, and exacerbate respiratory conditions (e.g. asthma) and cardiovascular diseases (e.g. heart disease). These effects contribute to higher hospital admissions, particularly among populations at higher risk, including the elderly and individuals with pre-existing conditions. Additionally, extreme heat places stress on healthcare systems and disrupts essential services. Heatwaves, defined as five or more consecutive days of extreme heat, also worsen air quality, further aggravating individuals with respiratory issues.

Approximately 93% of San Bernardino County (SBC) is located within desert regions, many of which are classified as Urban Heat Islands (UHIs). UHIs are associated with significantly higher temperatures, elevated pollution levels, and increased health risks. San Bernardino County also faces a critical challenge as climate change is projected to exacerbate the frequency and intensity of EHEs, leading to a heightened risk of heat-related illnesses and mortality. According to projections from the Cal-Adapt Extreme Heat Tool, the number of extreme heat days—defined as days between April and October where the maximum temperature exceeds the 98th percentile of historical maximum temperatures (based on data from 1961–1990)—is expected to rise rapidly from now through 2090[2]. This trend underscores the urgent need for adaptive strategies to mitigate the impacts of extreme heat on public health, infrastructure, and the environment.

Prioritized Risk 5: Bioterrorism Agent

Likelihood: Medium
Impact: High

Bioterrorism agents are defined as pathogen or toxin used intentionally to cause harm, panic, or disruption in a population. Bioterrorism agents, such as botulism, plague, or viral hemorrhagic fevers (e.g. Ebola, Marburg) are a public health risk because they can cause widespread illness and fatalities. Public health and healthcare systems may face overwhelming challenges, including a surge in morbidity and mortality, depending on the agent used and the population exposed. Healthcare facilities might become strained due to shortages of medical staff and resources. The psychological toll on the community could be severe, with widespread fear and panic, which would have long-term mental health impacts, and may lead to social disruption and breakdown trust in public

institutions. Moreover, the contagious nature of some agents, such as smallpox, could complicate containment and emergency response efforts, particularly in densely populated areas, where many people could become infected quickly. Additionally, some agents can be difficult to treat or lack effective vaccines, which can lead to a severe public health crisis.

While bioterrorism attacks are rare, historical incidents, such as the 2001 anthrax attacks in the United States, demonstrate that the threat is plausible. The accessibility of biological agents and the potential for misuse by nefarious individuals contribute to this risk. Advances in biotechnology and evolving threats on a global scale, further increase the possibility of a bioterrorism event.

Hazard Priorities – SBCDPH, Healthcare, and Non-Healthcare Participants

Risk scores were categorized into three main groups based on respondent type: SBCDPH, healthcare, and non-healthcare, to identify any potential bias in the data due to the number of participants for each group (Figure 7). It was found that four of the top five hazards identified (see "Analysis Section") ranked in the top five across all stratified analysis results for each group.

Figure 7. Final Risk Score Ranking by Participants

Ranking	Overall	SBCDPH	Healthcare Workers	Non-Healthcare Workers
1	**Earthquake**	Earthquake	Earthquake	Earthquake
2	**Electrical Failure**	Wildland Fire	Electrical Failure	Electrical Failure
3	**Wildland Fire**	Electrical Failure	Wildland Fire	Wildland Fire
4	**Extreme Heat Events**	Aerosolized Anthrax	Pandemic Influenza	Extreme Heat Events
5	**Bioterrorism Agent**	Extreme Heat Events	Extreme Heat Events	Flashflood

For participants from SBCDPH (27), the top five hazards prioritized were earthquake, wildland fire, electrical failure, aerosolized anthrax, and extreme heat events. For participants from healthcare facilities (89), the top five hazards prioritized were earthquake, electrical failure, wildland fire, pandemic influenza, and extreme heat events. For participants from non-healthcare facilities (137), the top five hazards prioritized were earthquake, electrical failure, wildland fire, extreme heat events, and flash flood.

Each group had one hazard that was not found in the overall group or other groups' top five hazards, likely due to their own perceptions and experiences with the hazard. Top hazards for SBCDPH, healthcare, and non-healthcare participants were aerosolized anthrax, pandemic influenza, and flash flood, respectively.

Aerosolized anthrax is a significant hazard for SBCDPH; this view is supported by the extensive policies and protocols in place for preparing and responding to a potential anthrax incident. The response to anthrax would involve the Federal Bureau of Investigation (FBI), law enforcement, and other agencies to determine whether it is a bioterrorism attack.

Pandemic influenza's inclusion as a notable hazard for healthcare workers may be due to the recency of the COVID-19 Pandemic, which started in 2020, and continues to be an issue of concern for older people and those with chronic underlying conditions. The COVID-19 pandemic led to a surge in the healthcare system, overwhelming healthcare workers and leading to burnout for many workers in the medical and public health industries. Preparedness to alleviate future pandemic events was ranked highly for this field and should continue to be taken into consideration for planning efforts.

Flash floods for non-healthcare workers may be of concern as they relate to extreme and unusual weather patterns that have been occurring in the region (i.e. Tropical Storm Hilary in 2023) and atmospheric river systems which usually occur during the winter months. Moreover, flash floods are a higher risk for burn areas due to wildland fires, which increases the risk of landslides and debris flows.

Participants

The type of organization with the most participants in the survey (Figure 8) were from hospitals, with 33 participants (13%) and County agencies with 32 participants (12%). SBCDPH was counted separately from County agencies and accounted for a large portion of responses with 27 (10%) participants. Other types of organizations with many participants include community-based organizations (27), SNFs (20), schools (14), and emergency management organizations (14).

Participants were also asked to identify the regions they serve in the county to ensure all regions were represented in the survey (Figure 9). This question allowed for multiple selections so participants could choose more than one region. The High Desert region had the most participants (119), followed by All Regions (102), Inland Valley (46), Desert (44), and Mountain (31) regions. Within the High Desert, the type of organizations with the most participants were community-based organizations (17) and SNFs (16). Within the All Regions, the types of organizations with the most responses were County agencies (30) and SBCDPH (23). For the Inland Valley, community-based organizations (6) had the most responses. For both Desert and Mountain regions, hospitals had the most with 11 and eight responses, respectively.

Figure 8. Participants by Organizational Type (n=253)

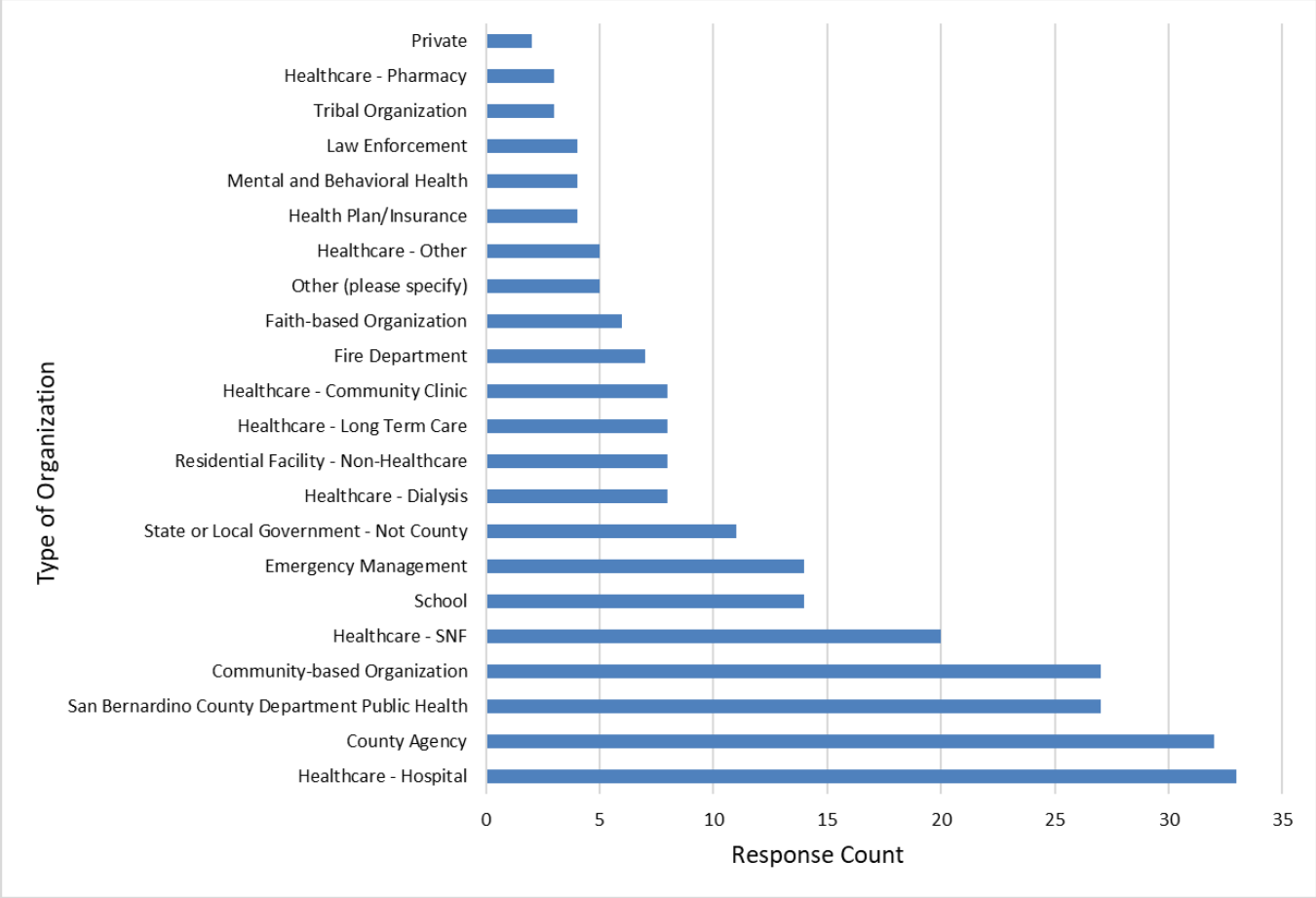
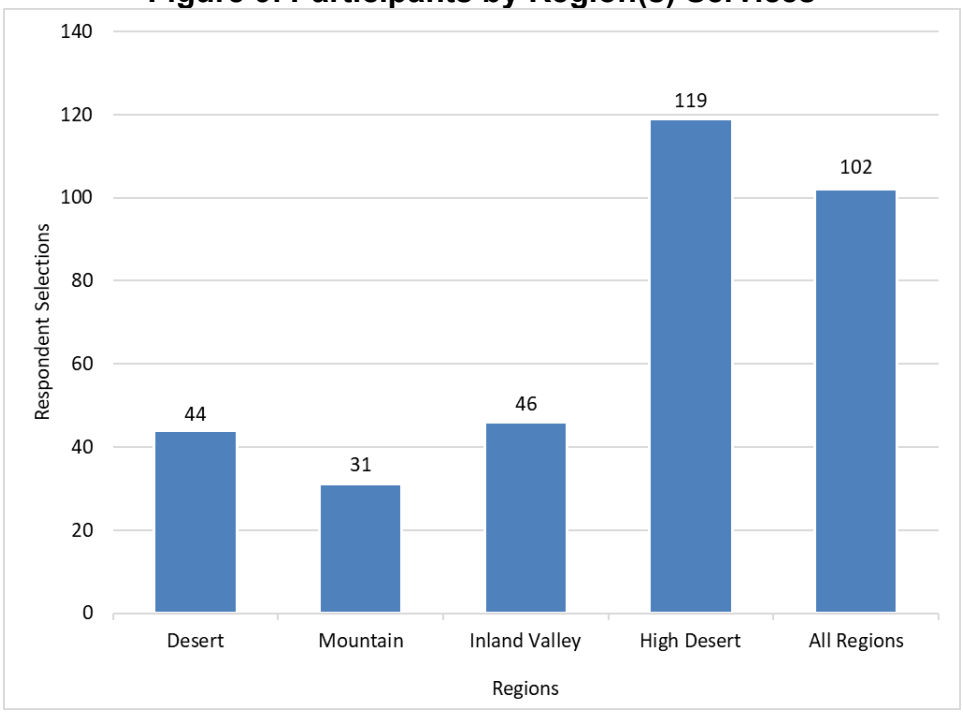


Figure 9. Participants by Region(s) Services



Discussion

Whole Community Planning

Whole Community Planning in emergency management is a holistic approach that engages government, businesses, nonprofits, and the public to enhance disaster preparedness, response, and recovery. It prioritizes collaboration, shared responsibility, and leveraging community strengths to build resilience. By involving diverse stakeholders, including underserved populations (i.e. elderly, children, individuals with disabilities and others with access and functional needs, low-income families, non-English speakers, homeless individuals, pet owners, and those who are homebound or have medical conditions), it ensures emergency plans reflect real needs and resources.

Planning for the prioritized risks that were identified in this assessment will include considerations for San Bernardino County residents with vulnerabilities that place them at higher risk during an emergency. Lessons learned from the COVID-19 pandemic has highlighted SBCDPH's success in identifying and fostering community-based partnerships as well as implementing strategies that provide needed resources directly to rural and hard-to-reach communities located throughout the county. The following are some whole community planning considerations for emergency preparedness and response for the top hazards identified:

- Identifying data sources for populations at higher risk in the county
- Conducting outreach with local organizations who have established trust and relationships with priority populations
- Developing tailored educational resources in different languages and media formats as well as alternative distribution and dissemination methods to reach different populations
- Identifying and addressing barriers to expand access and allocate resources to populations at most risk, including those with limited means (i.e. transportation, low-income, housing, etc.), through shelters, medical points of dispensing sites (MPODs), and other distribution sites for public health services and supplies
- Developing strategies that consider mental health interventions to address trauma, anxiety, and stress for those who may be disproportionately affected by the emergency
- Engaging priority populations throughout the planning process to ensure their needs and perspectives are incorporated (including mechanisms for ongoing feedback to address gaps and improve emergency response plans)
- Identifying and supporting community resilience and recovery initiatives and strategies to enhance and strengthen existing strengths (i.e. assets, resources, and networks) in the community

Next Steps

The results of the JRA will be used to inform and guide the Integrated Preparedness Planning Workshop(s) in order to develop SBCDPH's MYIPP. Further discussions will be conducted with key stakeholders to understand JRA results including the perceptions that supported participants' likelihood and impact choices. Other whole community planning considerations will also be discussed in these workshop(s) with stakeholders to ensure that the MYIPP aligns priorities, enhances coordination, and ensures sustainable resilience strategies for the community.

Limitations

One limitation to the analysis of the survey results was the insufficiency of information available for a few rare or unusual hazards such as volcanoes. Research for determining realistic hazard impact scenarios was challenging due to the uncommon occurrence of certain hazards occurring in similar areas of the county. This was particularly challenging for mental health impact estimates, which was derived primarily from LAC's RAMP tool. Additionally, there are certain impacts where indirect effects were not quantifiable (i.e. supply shortage and information systems failure).

Another limitation was the survey's structure for likelihood ranking. In the attempt to make the ranking of 39 different hazards more convenient for participants, participants were asked to group the hazards into three categories (Most Likely, Likely, and Least Likely) and then rank the hazards by likelihood of its occurrence within those categories. However, this was found to be the field where many partial participants stopped completing the survey. Future surveys will reconsider how to structure the questionnaire so that the hazards can be ranked more easily by participants.

Furthermore, the survey aimed to obtain a wide range of participants representing different sectors. While the survey was able to capture 253 complete responses (27 SBCDPH, 89 healthcare, and 137 non-healthcare), there was a limitation in the representation of different groups in the survey. Overall, the non-healthcare participants had the highest participation amongst the survey participants. The future iteration of this survey will aim to address all limitations and identify promotion strategies to ensure participation from more participants from different sectors in order to reflect the varied hazard risk perspectives in the county.

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Attachment A: Jurisdictional Risk Assessment

SAN BERNARDINO COUNTY | Public Health

The purpose of the Jurisdictional Risk Assessment (JRA) is to assess the health and medical risk to our county from potential hazards. This assessment will help San Bernardino County Department of Public Health (SBCDPH) develop emergency response plans for SBC for the next five years.

This JRA survey is strengthened by having as many participants as possible. It is NOT designed just for one response per agency. The more participation, the better.

Background Information

Our perspectives are shaped by our jobs, environment, and experience. This survey captures a few pieces of information to better understand and analyze the survey data.

Please enter your full name:

Please enter your email address:

Please enter the name of your organization:

Could you specify the region your organization serves?

- ☐ **Desert Region:** This region includes cities and communities in the eastern part of the county, characterized by desert landscapes such as the Mojave Desert. Cities like Barstow, Needles, and Twentynine Palms are located in this area.
- ☐ **Mountain Region:** The mountainous region covers the northern and eastern parts of the county, including the San Bernardino Mountains and portions of the San Bernardino National Forest. Communities like Big Bear Lake, Lake Arrowhead, and Crestline are part of this region.
- ☐ **Inland Valley Region:** This region encompasses the southwestern portion of the county, including the valley areas and suburban communities that are part of the Inland Empire. Cities like Ontario, Rancho Cucamonga, Fontana, and San Bernardino are located here.
- ☐ **High Desert Region:** This region includes cities and towns in the northern and central parts of the county at higher elevations. Cities like Victorville, Apple Valley, Hesperia, and Adelanto are part of this region.
- ☐ **All of San Bernardino County Regions**

What best describes your type of organization?

- ○ San Bernardino County Department Public Health
- ○ County Agency
- ○ Healthcare - Local EMS
- ○ Healthcare - Hospital
- ○ Healthcare - Community Clinic
- ○ Healthcare - Dialysis
- ○ Healthcare - Pharmacy
- ○ Healthcare - Long Term Care
- ○ Healthcare - SNF
- ○ Healthcare - Other
- ○ Emergency Management
- ○ Mental and Behavioral Health
- ○ Law Enforcement
- ○ Fire Department
- ○ Community-based Organization
- ○ Faith-based Organization
- ○ School
- ○ Tribal Organization
- ○ Private
- ○ Other (please specify)

NEXT

Part 1: Hazard Impacts

For each question below, please allocate a total of 100 points, between the categories below to indicate their relative importance to you in determining **risk,** based on your experiences preparing for or responding to emergencies.

Step 1a. Human Health and Healthcare Systems

Please allocate a total of 100 points to each of the following based on how important you believe that category is in determining **risk.** The more points you assign, the more important you think that category is, with the total points adding up to 100.
For example: If you assign 60 points to Human Health Impacts, you have 40 points to assign to Healthcare System Impacts.

Human Health	0
Healthcare Systems	0
Total	0

Step 1b. Human Health Impacts

Please allocate a total of 100 points to the smaller sub-categories within human health impacts, based on how important you believe that sub-category is in determining **risk**. The more points you assign, the more important you think that category is, with the total points adding up to 100.
Please note: If you hover over the impact sub-category, a short definition will appear.

Fatalities	0
Hospitalization	0
Outpatient Injuries	0
Mental Health Injuries	0
Total	0

Step 1c: Healthcare System Impacts:

Please allocate a total of 100 points for sub-categories within healthcare system impacts, based on how important you believe that sub-category is in determining **risk**. The more points you assign, the more important you think that category is, with the total points adding up to 100.
Please note: If you hover over the impact sub-category, a short definition will appear.

Hospital Impacts	0
Skilled Nursing Facility (SNF) Impacts	0
Outpatient Impacts	0
Pharmacy Impacts	0
Dialysis Center Impacts	0
Total	0

Please enter any hazard impact categories that you believe are missing in the previous questions. This will help inform future Jurisdictional Risk Assessments:

NEXT

Part 2: Hazard Likelihood

For each question below, please allocate a total of 100 points, between the categories below to indicate their relative importance to you in determining **risk,** based on your experiences preparing for or responding to emergencies.

Please group the following 39 hazards into the following groups, based on the likelihood that they would happen over the **next five years** in San Bernardino County:

- MOST likely to happen, LIKELY to happen, and LEAST likely to happen
- *Please note: If you hover over the hazard, a short definition will appear.*

	Most Likely	Likely	Least Likely
Aerosolized Anthrax	☐	☐	☐
Airplane Crash	☐	☐	☐
Avalanche	☐	☐	☐
Bioterrorism Agent	☐	☐	☐
Chemical Attack	☐	☐	☐
Civil Disorder	☐	☐	☐
Communication Failure	☐	☐	☐
Cyber Attack	☐	☐	☐
Dam Failure	☐	☐	☐
Drought	☐	☐	☐
Earthquake	☐	☐	☐
Electrical Failure	☐	☐	☐
Emergent Disease	☐	☐	☐

Explosives Device	☐	☐	☐
Extreme Heat Events	☐	☐	☐
Flood (500 Year)	☐	☐	☐
Flash flood	☐	☐	☐
Foodborne Illness	☐	☐	☐
Hazardous Materials Release	☐	☐	☐
Hurricane/Tropical Cyclone	☐	☐	☐
Industrial Incident	☐	☐	☐
Information Systems Failure	☐	☐	☐
Land Subsidence	☐	☐	☐
Landslide	☐	☐	☐
Mass Shooting	☐	☐	☐
Nuclear Attack	☐	☐	☐
Pandemic Influenza	☐	☐	☐
Severe Winter Storm	☐	☐	☐
Sewer Failure	☐	☐	☐
Smallpox	☐	☐	☐
Supply Shortage	☐	☐	☐
Tornado	☐	☐	☐
Transportation Failure	☐	☐	☐
Urban Fire	☐	☐	☐
Volcano	☐	☐	☐
Water Contamination	☐	☐	☐
Water Supply Disruption	☐	☐	☐
Wildland Fire	☐	☐	☐
Windstorm	☐	☐	☐

NEXT

Rank Most Likely

Please rank the hazards previously grouped as "Most Likely" from **most likely** to **least likely**.

_____ Aerosolized Anthrax
_____ Airplane Crash
_____ Avalanche
_____ Bioterrorism Agent
_____ Chemical Attack
_____ Civil Disorder
_____ Communication Failure
_____ Cyber Attack
_____ Dam Failure
_____ Drought
_____ Earthquake
_____ Electrical Failure
_____ Emergent Disease
_____ Explosives Device
_____ Extreme Heat Events
_____ Flood (500 Year)
_____ Flash flood
_____ Foodborne Illness
_____ Hazardous Materials Release
_____ Hurricane/Tropical Cyclone
_____ Industrial Incident
_____ Information Systems Failure
_____ Land Subsidence
_____ Landslide
_____ Mass Shooting
_____ Nuclear Attack
_____ Pandemic Influenza
_____ Severe Winter Storm
_____ Sewer Failure
_____ Smallpox
_____ Supply Shortage
_____ Tornado
_____ Transportation Failure
_____ Urban Fire
_____ Volcano
_____ Water Contamination
_____ Water Supply Disruption
_____ Wildland Fire
_____ Windstorm

NEXT

Rank Likely

Please rank the hazards previously grouped as "Likely" from **most likely** to **least likely**.

_____ Aerosolized Anthrax
_____ Airplane Crash
_____ Avalanche
_____ Bioterrorism Agent
_____ Chemical Attack
_____ Civil Disorder
_____ Communication Failure
_____ Cyber Attack
_____ Dam Failure
_____ Drought
_____ Earthquake
_____ Electrical Failure
_____ Emergent Disease
_____ Explosives Device
_____ Extreme Heat Events
_____ Flood (500 Year)
_____ Flash flood
_____ Foodborne Illness
_____ Hazardous Materials Release
_____ Hurricane/Tropical Cyclone
_____ Industrial Incident
_____ Information Systems Failure
_____ Land Subsidence
_____ Landslide
_____ Mass Shooting
_____ Nuclear Attack
_____ Pandemic Influenza
_____ Severe Winter Storm
_____ Sewer Failure
_____ Smallpox
_____ Supply Shortage
_____ Tornado
_____ Transportation Failure
_____ Urban Fire
_____ Volcano
_____ Water Contamination
_____ Water Supply Disruption
_____ Wildland Fire
_____ Windstorm

NEXT

Rank Least Likely

Please rank the hazards previously grouped as "Least Likely" from **most likely** to **least likely**.

_____ Aerosolized Anthrax
_____ Airplane Crash
_____ Avalanche
_____ Bioterrorism Agent
_____ Chemical Attack
_____ Civil Disorder
_____ Communication Failure
_____ Cyber Attack
_____ Dam Failure
_____ Drought
_____ Earthquake
_____ Electrical Failure
_____ Emergent Disease
_____ Explosives Device
_____ Extreme Heat Events
_____ Flood (500 Year)
_____ Flash flood
_____ Foodborne Illness
_____ Hazardous Materials Release
_____ Hurricane/Tropical Cyclone
_____ Industrial Incident
_____ Information Systems Failure
_____ Land Subsidence
_____ Landslide
_____ Mass Shooting
_____ Nuclear Attack
_____ Pandemic Influenza
_____ Severe Winter Storm
_____ Sewer Failure
_____ Smallpox
_____ Supply Shortage
_____ Tornado
_____ Transportation Failure
_____ Urban Fire
_____ Volcano
_____ Water Contamination
_____ Water Supply Disruption
_____ Wildland Fire
_____ Windstorm

END OF SURVEY

Acknowledgements

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