



# Utah public health Jurisdictional risk assessment 2024 Statewide report

## Signature page

The Jurisdictional Risk Assessment (JRA) is a public health focused approach to understanding all hazards Utah may face and prioritizing which would cause the biggest impact to our population and health infrastructure. This statewide report is a summary and analysis of local JRA's completed within each of the 13 health districts, as well as modified tools completed by four tribal organizations and the Utah Department of Health and Human Services (DHHS). JRA reports are conducted once every five years and updated as needed.

In this and all preparedness planning documents, the state is committed to an inclusive approach to make sure all stakeholders have the tools necessary to prepare for and respond to any emergency that affects the health and well-being of our citizens.



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# Utah public health JRA 2024 statewide report

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## Introduction

The Jurisdictional Risk Assessment (JRA) is a public health focused approach to understanding all hazards Utah may face, and prioritizing which has the highest risk to negatively impact the population and health infrastructure. Highest risk is a combination of many factors, including jurisdictional characteristics and vulnerabilities, hazard probability and impact scores, as well as mitigation efforts already in place. Public health preparedness and response teams and partners will benefit from using the outcomes of this tool on a regular basis to make sure those hazards that pose the most risk are better understood and planned for. This JRA is meant to be used to identify existing gaps and help determine future hazards-specific planning, training, and exercise activities that should be conducted with public health preparedness partners.

## Background

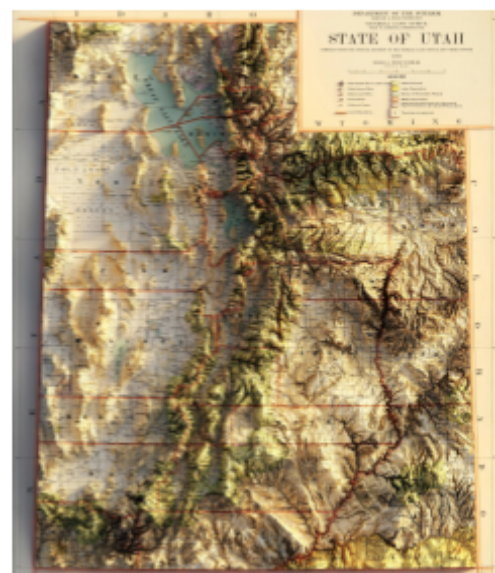
To gain a comprehensive understanding of jurisdictional risks, this background section provides context of state characteristics and health infrastructure.

### State characteristics and vulnerabilities

#### Geography

Utah is approximately 84,917 square miles and is the 13th largest state in land mass. Three major land areas characterize its geography: the central Rocky Mountains, the Basin and Ridge Region of the northwest, and the Colorado Plateau in the south and southeast. Running down the middle of the state is the Wasatch Fault, from the Utah/Idaho border to central Utah. About 67% of the land is federally owned and includes five national parks and five national forests. There are several lakes and

**Figure 1.** Utah topographical map, Muir Way, 2017.

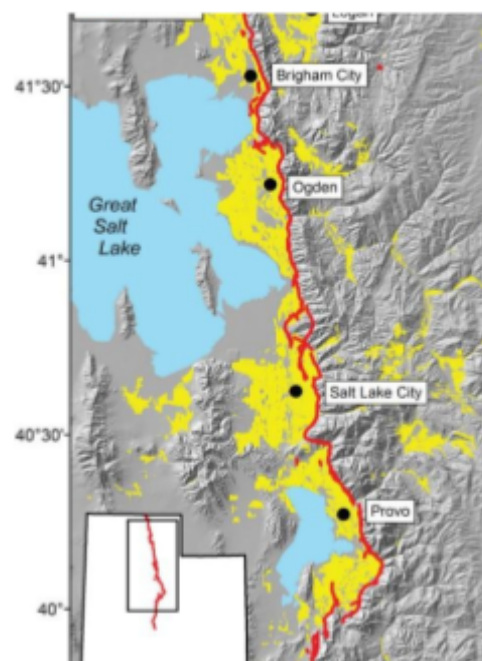


ivers, the largest of which is the Great Salt Lake which covers more than one million acres of northern Utah.

**Elevation.** Utah is the third highest state in the nation, with a mean elevation over 6,000 feet. Cities range from 2,000 to 9,800 feet above sea level. Figure 1 gives an indication of the mountainous regions which dominate much of the state (FAA, 2019).

**Earthquake faults.** The Wasatch Fault, located in Utah and the southern Idaho border, is the longest continuous, active normal fault in the U.S. and represents a major threat to many Utahns. In fact, 80% of residents reside along the fault (Machette, 1991). About 500 earthquakes are located in this fault zone each year, and 60% of the 3.0 or larger earthquakes occur in this region (University of Utah, 2019). Figure 2 shows the most notable Wasatch Fault line (in red), alongside its most urban areas (in yellow). Those familiar with the state will also note the majority of these run north and south in the general area of I-15, a major roadway.

**Figure 2.** University of Utah seismograph stations, 2010.



**Climate.** Temperatures vary widely throughout the state due to the three climate regions and large geographic area. Although extremes can and do occur at both ends of the state, winter lows typically average between 20–30 degrees Fahrenheit, and summer highs between 90–100 degrees Fahrenheit. Utah tends to be a dry state, but is prone to both flooding and drought. Average annual precipitation can range from just 4 inches in the western basin areas to more than 44 inches in lake and mountain regions in the northeast (U.S. Climate Data, 2024).

**Air quality.** Cities located at the basin of mountains in Utah experience seasonal air pollution. The mountains shield the city air from strong winds that could help clear out inversions. In this event, the pollutants in the cooler air are unable to rise and disperse into the atmosphere which causes pollution to linger and build until the weather changes

(DEAQ, 2020). Fluctuations in temperature and precipitation play a significant role in the air quality. Between 2016 and 2018, there was a weighted average of 25.7 days of unhealthy ozone and 11.5 days of unhealthy particulate matter (PM<sub>2.5</sub>). Brigham Young University researchers found that Utah air pollution reduces the average resident's life by anywhere from 1.1 to 3.5 years (Errigo, 2020).

## Infrastructure

**Transportation.** Four interstate highways travel through the state, namely I-15, I-70, I-80, and I-84. In addition to being highly trafficked with passenger vehicles, all are designated as hazardous material routes, and frequently carry trucks laden with potentially dangerous liquids or gases (FMCSA, 2024). Figure 3 highlights these major roads. Much of the population resides nearby and frequents one or more of these interstates and relies on goods and supplies being carried into the state along these routes. Railways are also a major mode of transportation for goods, supplies, and hazardous materials and are used in many areas in the state. Additionally, there are more than 30 airports in the state, the largest of which is the Salt Lake City International Airport (Airport Authority, 2024).

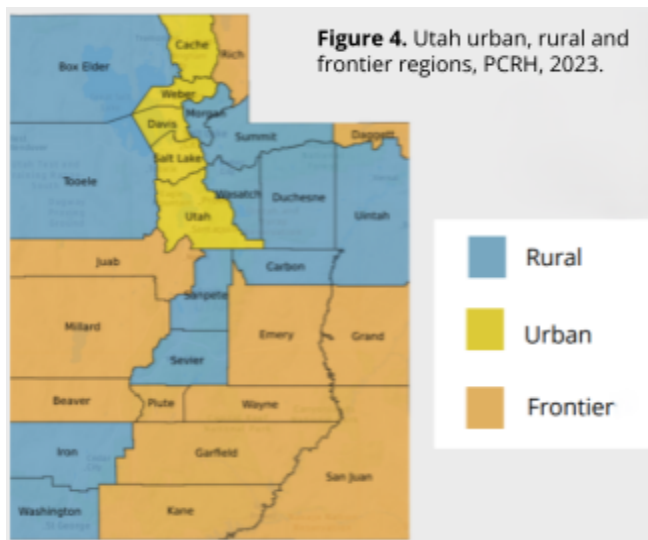
**Figure 3.** Utah interstates / hazmat routes, ARCGIS, 2019.



**Dams.** Of the more than 900 dams in the state, at least 266 are classified as high-hazard. This classification means dam failure would likely result in loss of life and possibly cause significant economic losses. The ages of the dams, earthquake potential, and population growth near dam breach zones are all risk factors of dam failures (ASCE, 2020).

## Demography

**Population growth and dispersion.** As of 2024, the population in the state of Utah is 3,454,232 people (USA Facts, 2023). There has been steady population growth increase in



recent years, and Utah is currently the fourth fastest growing state in the country with a growth rate of 1.64% (World Population Review, 2024). The majority (80%) of the population lives in the urban counties in and around Salt Lake along the Wasatch Front. In addition, Utah continues to enjoy frontier and rural communities in the majority of its counties (see figure 4). However, some counties are transitioning to becoming more urban with increased population growth.

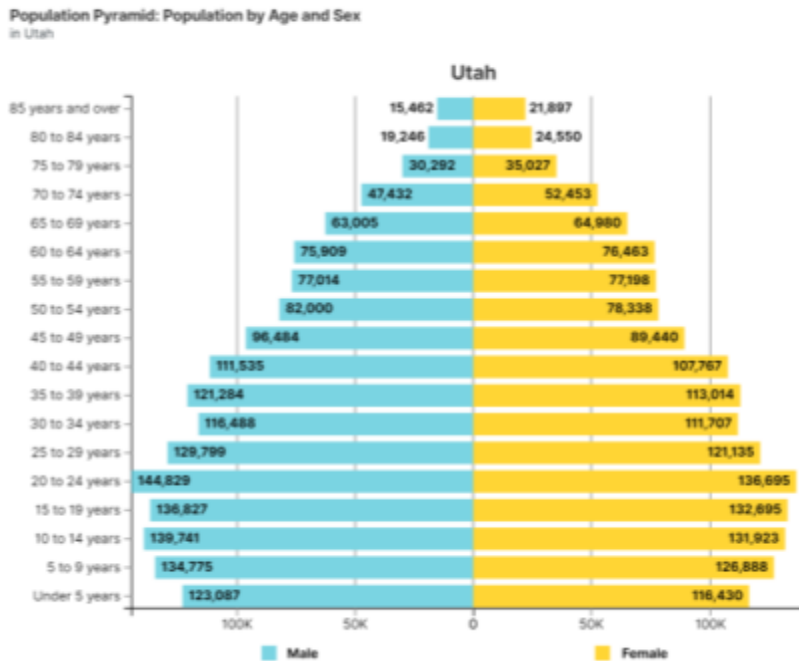
**Race.** According to the most recent American Community Survey, the racial composition of Utah is broken down as follows: 83.7% White/Caucasian, 5.6% two or more races, 5.2% other race, 2.3% Asian, 1.2% Black or African American, 1.0% Native American, 0.9% Native Hawaiian or Pacific Islander (World Population Review, 2024).

**Languages.** A language other than English is spoken at home for 15% of the population (OHE, 2022). These languages include, but are not limited to: Spanish, Chinese, Austronesian languages, Portuguese, German, Navajo, Vietnamese, French, Tagalog, Korean, Japanese, Arabic, other Indo-European languages, Serbo-Croatian, Russian, Thai, Nepali, Somali, Swahili, and more.

**Refugees.** There are approximately 60,000 refugees living in the state, with between 400–1,000 new refugees coming each year. In 2023, the regions of origin with the most refugees from lowest to highest were East Asia and Pacific, Europe and Eurasia, Near East/North Africa/Middle East, South and Central Asia, and Latin America. It is estimated there are more than 30 languages spoken by refugees in Utah (Gardner, 2021). In 2024, 91.5% of Utahns were born in the U.S. and 61.6% were born in Utah (World Population Review, 2024).

**Age and sex.** There are a large number of children younger than age 18 who live in Utah, roughly 30% of the population. Utah leads the nation in the number of births for the

**Figure 5.** Utah population pyramid, ACS, 2022.



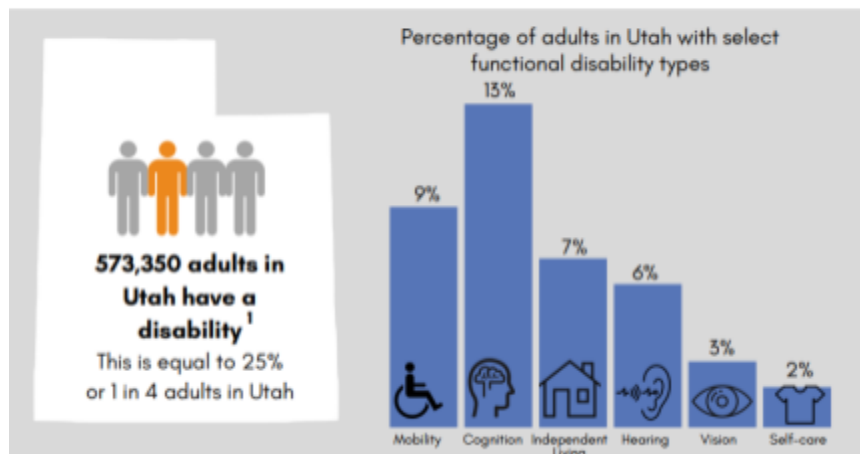
population at 12%, compared with 10% for the national average (U.S. Census Bureau, 2022). One of the reasons for this may be its larger than normal group of 20-40 year olds, as shown in the population pyramid in figure 6 (ACS, 2022). Sex remains even, with roughly 50% female and 50% male.

**Household economics.** There are nearly one million households in Utah, with an average of three people per home. The median household

income is \$65,000 and approximately 10% have an income below the national poverty line (World Population Review, 2024). The highest level of poverty is among the American Indian/Alaska Native population, with 23.7% below the poverty level.

**Utahns with disabilities.** As of 2021, nearly one in four adults self-reported they live with a disability. The most common disabilities include cognitive disabilities (12.9%), mobility-related disabilities (9%), disabilities which impact independent living (6.6%), hearing-impaired or deaf (5.45%), vision-related disabilities (3%), and disabilities which impact

**Figure 6.** Utah adults with disabilities, CDC, 2021.





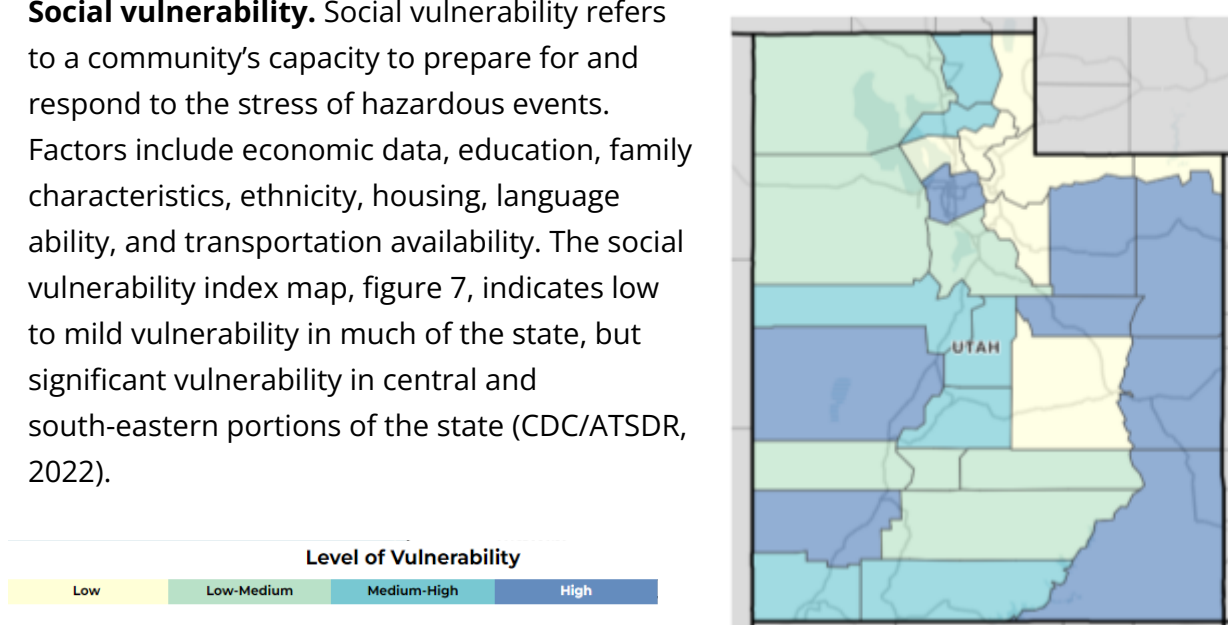
self-care (2%) (CDC, 2021). Support services provided for those with a disability may include community living, day services, supported employment services, housing support, healthcare services, and support coordination services (DSPD, 2019).

**Immunization rates.** In 2023, the Immunization Coverage Report indicated estimates of vaccine coverage in 2-year olds in Utah exceeded that of the U.S. and region 8 in all categories except “2 or more doses of influenza vaccine” and “3 or more doses of hepatitis B vaccine” (DHHS, 2021). The percentage of immunized 24-month-old children with the birth year 2020 was 78.3% while the U.S. coverage rate was 67.9%. Utah ranked 4th out of 50 states for this measure (IBIS, 2023). Although vaccine rates are high, several counties allow school vaccine exemptions. Across the state, among all age groups, influenza vaccines have decreased (IBIS, 2023).

**Tourism.** More than 20 million tourists visit Utah annually, which is approximately 6.2 tourists per permanent resident (OmniTrak, 2022). Winter and summer tend to be the most popular travel seasons, though tourists come all year. Popular travel locations include the 14 ski resorts, five national parks, 11 national monuments, 43 state parks, one national historic site, two national recreation areas and festivities such as the Sundance film festival and the Shakespeare festival (Leaver, 2024).

**Social vulnerability.** Social vulnerability refers to a community’s capacity to prepare for and respond to the stress of hazardous events. Factors include economic data, education, family characteristics, ethnicity, housing, language ability, and transportation availability. The social vulnerability index map, figure 7, indicates low to mild vulnerability in much of the state, but significant vulnerability in central and south-eastern portions of the state (CDC/ATSDR, 2022).

**Figure 7.** Social vulnerability index map, CDC/ASTDR 2022.

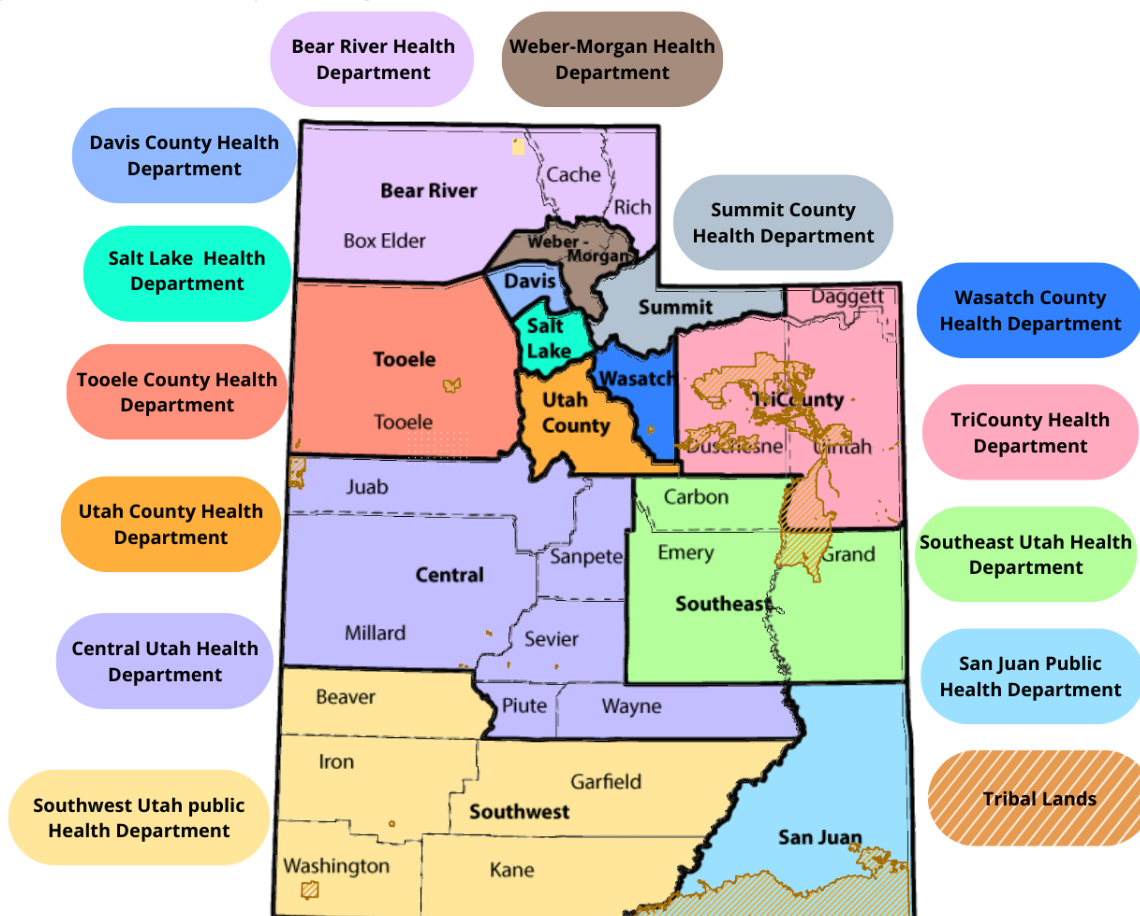


**emPOWER data.** The HHS emPOWER program reports numbers of individuals by zip code who are using Medicare services or equipment, and can provide contact information for outreach to these individuals if a disaster strikes. As of June 2023, there were 438,823 Medicare beneficiaries in Utah. Of these, there were 42,777 residents who used electricity-dependent devices and durable medical equipment, including 12,434 using home oxygen tanks. Additionally, there were reportedly 10,743 participating in home health services and 1,706 using at-home hospice services (HHS, 2023).

## Health infrastructure

### Public health system

**Figure 8.** Local health department jurisdictions



DHHS is the overarching state agency responsible for public health in Utah, and works in collaboration with the 13 local public health departments, designated in figure 8. Local public health provides vital services to Utahns, including: environmental safety, epidemiological surveillance, health education, food safety regulation, preventive services, and disaster management. Public health is also the designated lead for emergency support function 8—health and medical, and as such, has a responsibility to coordinate and provide leadership to support health entities during a disaster.

The Utah Association of Local Health Departments (UALHD), the Utah Association of Local Health Officers (UAHLO), and the Utah Public Health Association (UPHA) all contribute to a healthier Utah through advocacy, education, and collaboration. At the federal level, Utah public health is supported by the U.S. Department of Health and Human Services (HHS), including the Centers for Disease Control and Prevention (CDC) based in Atlanta, Georgia, and the Administration for Strategic Preparedness and Response (ASPR), with Region VIII headquartered in Denver, Colorado.

## Tribal health system

There are eight American Indian tribes in Utah. These tribes are shown in the map in figure 5, and listed below:

- Confederated Tribes of Goshute
- Paiute Indian Tribe of Utah
- San Juan Southern Paiute Tribe
- Northwestern Band of Shoshone Nation
- Skull Valley Band of Goshute
- Ute Indian Tribe of the Uintah and Ouray Reservation
- Ute Mountain Ute Tribe
- Navajo Nation

**Figure 9.** Locations of tribal lands, IHFS, 2024.



There are a number of healthcare centers and clinics operated by I/T/U or Indian Health System partners. The I/T/U partners consist of Indian Health Service, Tribal-638 clinics and Urban Indian Organizations. They are located throughout the state and provide services to American Indian and Alaska Native populations in Utah, and are listed below.

- FourPoints Community Health Centers, Southwestern Utah
  - FourPoints Health, Cedar City
  - FourPoints Health, Kanosh
  - FourPoints Health, Richfield
  - FourPoints Health, Shivwits
  - FourPoints Health, St. George
- Nat-su Healthcare, Tooele
  - Tooele Clinic
- Indian Health Services
  - Fort Duchesne IHS Health Center
- Sacred Circle Health Care, Confederated Tribes of the Goshute Reservation
  - Salt Lake City Main Office, Salt Lake City
  - Fairbourne Station, West Valley City
  - Ibapah Clinic, Ibapah
  - Pamela's Place, Salt Lake City
- Urban Indian Center, Salt Lake City
- Utah Navajo Health System, Southeastern Utah
  - Montezuma Creek Community Health Center
  - Blanding Family Practice Community Health Center
  - Monument Valley Community Health Center
  - Navajo Mountain Community Health Center

## Healthcare system

There are several health systems operating facilities in Utah, including hospitals, nursing homes, home health agencies, and clinics. Associations represent the various facilities in the state, including the Utah Hospital Association (UHA), the Utah Health Care Association (UHCA), and the Association for Utah Community Health (AUCH).

**Figure 10.** Utah hospitals by trauma level



**Utah hospitals.** Healthcare facilities in Utah according to trauma care designation are shown in figure 10 (DHHS, 2019). There are currently three Level I trauma centers and five Level II trauma centers. Additionally, there are six Level III and twenty Level IV trauma centers. The University of Utah holds the only burn center and is located in Salt Lake City. Primary Children’s Hospital provides the highest level of care for pediatric patients, and is also located in Salt Lake City. Utah hospitals overall report more than 7.8 million outpatient visits and more than 236,000 inpatient admissions annually (UHA, 2019). As of 2018, there were 4,588 staffed beds at non-federal, short-term, acute care hospitals (American Hospital Directory, 2018).

**Physician rates.** Active physician rates for the population is considerably lower than the nationwide average. In 2023, there were 184.3 physicians per 10,000 people, compared with the nation’s 232 physicians per 10,000 people (United Health Foundation, 2023). A similar trend is found in all years of reporting. The ratio of primary care physicians to population is also lower in Utah, 5.65 per 10,000 compared with 7.54 per 10,000 in the U.S. (DHHS, 2018). And although 21.5% of the population live in rural areas, only 11% of primary care providers, 16% of dental care providers, and 9% of mental health providers work there (Utah Primary Needs Assessment, 2021).

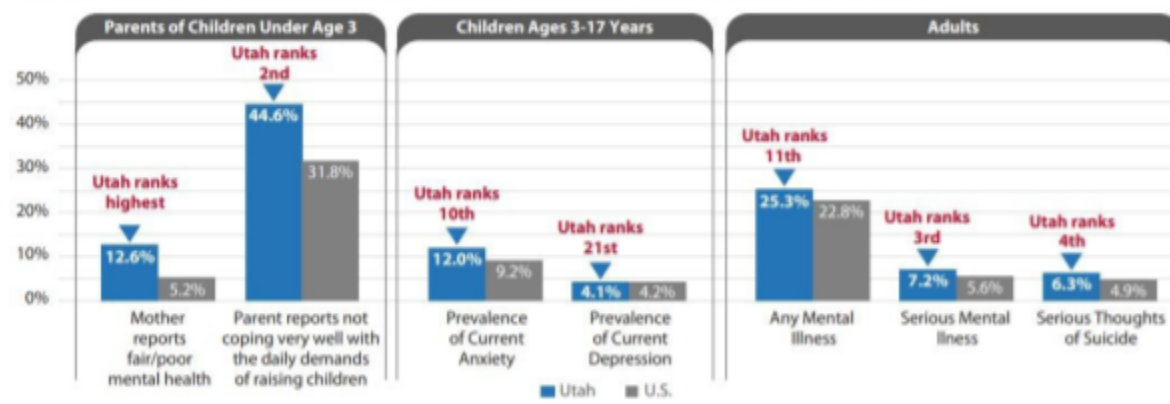
## Mental health system

The primary state agency responsible for mental health services is the DHHS Division of Substance Use and Mental Health (DSUMH), which works collaboratively with local mental health and substance use authorities. Medicaid services and the National Alliance on Mental Illness-Utah, as well as a broad range of private mental and behavioral practices and services, are also valuable partners (DSAMH, 2024).

**Availability of services.** Mental health care availability is particularly low in rural areas of the state. In rural areas, there's only 1 mental health provider per 55,000 residents—compared to 1 per 25,000 elsewhere in the state (Reinert, Fritze & Nguyen, 2022).

**Mental illness in Utah.** Utah ranks 11th highest among states for adults with any mental illness. Utah ranks 3rd highest for adults with serious mental illness, and 4th highest for adults with serious thoughts of suicide (Gardner, 2024). With age-adjusted rates for 2020, more adults reported seven or more days when their mental health was not good in the past 30 days (22.6%) when compared to adults in the U.S. as a whole (20.5%). This percentage was higher for adults with lower income levels (DHHS, 2022). Older adults are 40% less likely than younger adults to seek or receive treatment for serious mental illness (Wang, 2000).

**Figure 11.** Mental health indicators among Utah parents, children, and adults. 2020-2021.



# Risk assessment methods

This section describes the tool used to identify and analyze hazards, the process for collecting risk assessment data at the local level, and the aggregation of local data to produce statewide results.

## Utah modified hHAP tool

### Origins

A small workgroup of DHHS preparedness staff and local health department emergency response coordinators (ERCs) chose and modified an excel-based tool to use for the 2024 JRA. This was the same tool used for the 2019 JRA, with a few minor modifications.

The original tool was developed by the Los Angeles County Department of Public Health, with permission granted by its creators to modify it to be more useful to Utah. The Utah Modified Health Hazard Assessment and Prioritization (Utah hHAP) tool differs from the original in the number and description of some of the hazards analyzed, inclusion of an optional Public Health Emergency Preparedness Capabilities Self Evaluation, a new JRA instructions and scoring guide, and a proposed agenda to be used for tool completion. The 2024 version of the tool was further modified to include a “human-caused” hazard category (existing hazards were re-categorized into this new category, but no new hazards were created), and hazard scenarios were made more general to be more applicable to rural or urban areas.

### Hazards

The Utah hHAP tool includes 52 hazards categorized as either natural, biological, chemical and radiological, technological, or human-caused. Hazards are shown by type in table 1. Hazard scenarios are included for all users in the instructions and scoring guide, and provide generalized descriptions of the impact to the community and health infrastructure. In order to make the hazards more applicable to urban or rural settings, scenarios state general health severity and infrastructure impact information rather than numbers of ill, injured, or deceased.

**Table 1.** Hazards assessed in the modified Utah hHAP tool, by hazard type

Natural	Biological	Chemical and radiological	Technological	Human-caused
Avalanche	Botulism	Factory chemical spill	Communications failure	Active shooter
Climate change	Communicable disease outbreak	Industrial plant explosion	Electrical failure	Agroterrorism
Dam failure	Emergent disease	Mass casualty hazmat incident	Information systems failure	Aerosolized anthrax
Drought	Food supply contamination	Radiological incident – fixed facility	Oil spill	Blister agent
Earthquake - major	Pandemic flu	Train accident – chemical release	Sewer failure	Civil disorder
Earthquake - moderate	Tularemia		Supply shortage	Cyber attack
Extreme summer weather	Vector-borne disease		Transportation infrastructure failure	Improvised explosive device
Fire - large scale urban			Water supply disruption	Intentional food contamination
Flood				Intentional water contamination
Landslide				Nerve agent
Population displacement				Nuclear explosion – 10 kiloton
Severe winter storm				Pneumonic plague
Thunderstorm & lightning				Radiological dispersal device
Tornado				Ricin
Volcano				Smallpox
Wildfire				
Windstorm				

## Local, tribal, and state use

The Utah hHAP tool was designed to be used at the local, tribal, and state level. Slight modifications were made to the tool to accommodate various settings and uses. Following step-by-step information in the JRA instructions and scoring guide, facilitators gathered health and response partners to jointly analyze the risks posed by the 52 hazards included



in the tool. Facilitators first reviewed jurisdictional characteristics and demographics, including access and functional needs data, then led group discussions to determine and input scores into the Utah hHAP tool for various risk components for each of the 52 hazards.

Risk components analyzed included hazard probability, health severity, impacts (to the local community, public health system, medical system, and mental health system), and health department and response partner mitigation efforts and resources. Relative risk scores and rankings for each hazard were then automatically calculated by the tool, revealing the jurisdiction's top ten priority threats.

Relative risk scores were calculated using the following formula:

**Relative risk score = probability × health severity × impacts × mitigation efforts.**

## Risk components

The following risk components were assessed for each hazard, and assigned a number based on likelihood or severity.

**Probability.** The probability of each hazard is scored based on the likelihood of occurrence over the next 25 years. This is the only component with a possibility of a 0.0 score, meaning the likelihood of occurrence is zero. Scores range from 0.0 to the highest score of 4.0, which means the hazard is likely to occur cyclically or annually over the next 25 years.

**Health severity.** The health severity risk component measures the potential for injury, illness, and death. These scores range from 1.0, meaning marginal health consequences for the population, to 4.0 which indicates the event would be catastrophic. The scenarios for each hazard provided some insight for how they should be scored on this component; however, variation of scores among participants is influenced by jurisdiction specifics, such as differences in access to emergency health care.

**Health system impacts.** The Utah hHAP tool examines each hazard according to the impact on the community, as well as the impact to the public health, medical, and mental health systems in the jurisdiction. It asks users to rate how the hazard would affect the local agencies' and companies' ability to continue delivering health services in the

community. Rating scores between 0.5 and 2.0 refer to no or limited disruptions to service delivery. Scores between 3.0, “critical,” or 4.0, “catastrophic,” require deferment of all non-essential services, additional supplies and staffing needed, and the likelihood of a local and state declaration of emergency. The 4.0 rating adds the likelihood of a nationally-declared emergency, as well as the inability to meet supplies and staffing requirements.

**Mitigation efforts.** The last two risk components in the Utah hHAP tool are the mitigation efforts in place by both public health and local ESF-8 partners to reduce the worst effects of any given hazard. This could include resources, plans, training, and exercises specific or relevant to the hazard. These two risk components differ from the others in that a higher score is desirable, meaning more mitigation efforts have been accomplished. A score of 4.0 means an “extreme” level of mitigation, such as having approved and updated continuity of operations plans, drills, exercises, trainings, and other events with local partners specific to the hazard, as well as stockpiled supplies or available resources on hand to meet the needs. A score of 1.0, by contrast, means a “low” level of mitigation, meaning no or outdated response plans, few if any resources, etcetera.

## Capability self-evaluation

An optional section entitled “PHEP capability self-evaluation” is included as part of the Utah modified hHAP tool. This section gives jurisdictional participants a chance to review preparedness efforts specific to the top five identified hazards for their area across public health emergency preparedness and response capabilities. Users were asked to review the functions and tasks associated with each capability, and provide a rating from one to four, indicating to what extent that capability is in effect for each top hazard. A score of one is a mark of “limited capability” while a score of 4 marks “full capability.” Results of the capability self-evaluation are not included in this report, as this section was not required and is strictly for the benefit of the participating jurisdiction.

## Statewide aggregation

The DHHS preparedness and response program reviewed and aggregated the results of all 13 LHD hHAP tools, four tribal organizations and DHHS for the purposes of understanding statewide trends and top hazards. The top hazards for each jurisdiction were first obtained from each jurisdiction's completed hHAP tool. With the combined list of top identified hazards, aggregated risk component scores were determined using the scores from each participating jurisdiction and calculating the average. This was done for every risk component (such as probability and public health infrastructure impact) of each top hazard. These aggregated values were then entered into the hHAP tool where they were automatically weighted and calculated to determine relative risk scores in the same manner as the local and tribal JRA hazard scores were determined, using the formula:

**Relative risk score = probability × health severity × impacts × mitigation efforts.**

Out of the 52 hazards analyzed we were able to identify the top 20 hazards whose assessment revealed the greatest risk overall. An analysis of the results of this aggregation of scores is provided in the following section.

## Results

The aggregation process resulted in identification of a wide range of top hazards and relative risk scores, even though all health districts used the same tool and analyzed the same 52 hazards. This is due to differences such as demography, geography, local health infrastructure, and local mitigation strategies in place. This section identifies the top health threats for each organization, as well as the top hazards for the state as determined by an analysis of data from local, tribal, and state completed hHAP tools.

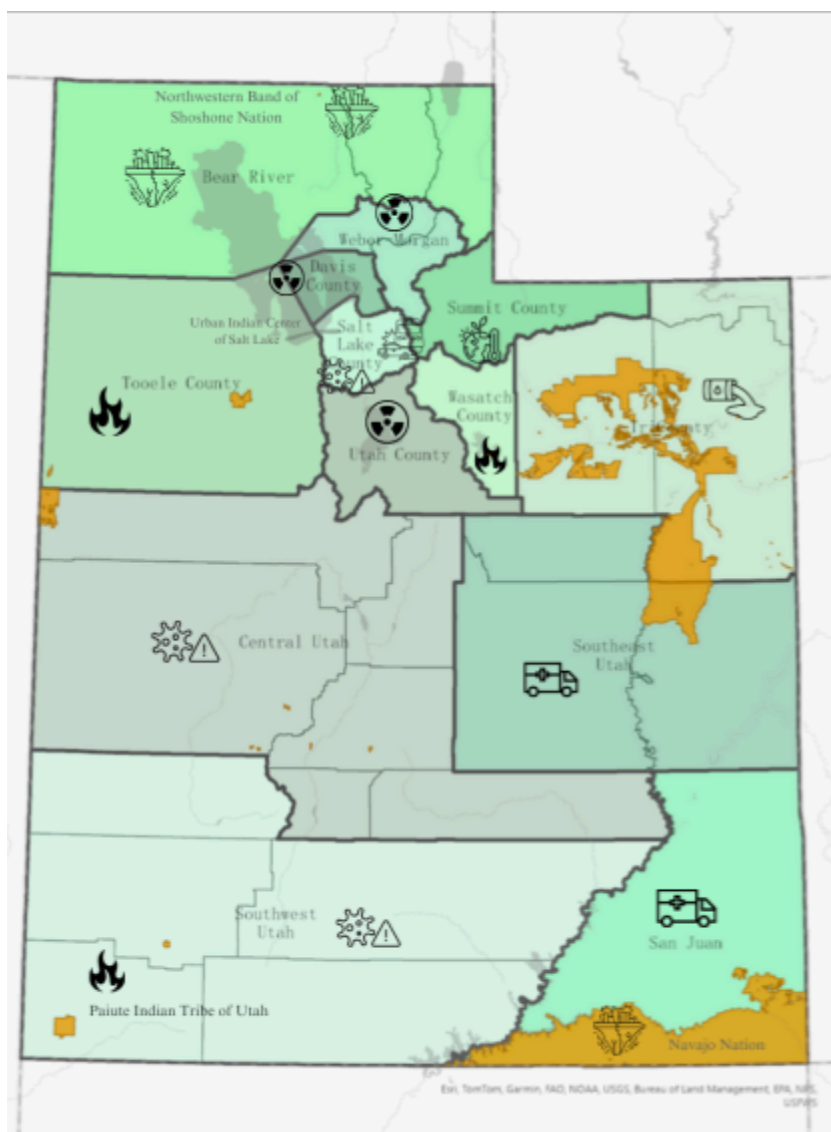
## Local, tribal, and state top 5 hazards

Each completed Utah hHAP tool produced a rank-ordered list of top hazards based on relative risk scores. Table 2 shows the top five hazards for each health district and tribal organization that completed a Jurisdictional risk assessment. The map in figure 12 shows the number one hazard identified for each.

**Table 2.** Top 5 hazards by jurisdiction.

<b>Top 5 hazards</b>		
<b>NW Band of Shoshone Nation</b>	<b>Paiute Indian Tribe of Utah</b>	<b>Urban Indian Center</b>
1. Earthquake - major	1. Wildfire	1. Train/truck accident - hazmat
2. Pandemic flu	2. Earthquake - major	2. Pandemic flu
3. Train/truck accident - hazmat	3. Supply shortage	3. Wildfire
4. Wildfire	4. Pandemic flu	4. Supply shortage
5. Supply shortage	5. Train/truck accident	5. Earthquake - major
<b>Utah Navajo Health System</b>	<b>Bear River</b>	<b>Central</b>
1. Earthquake - major	1. Earthquake - major	1. Emergent disease
2. Pandemic flu	2. Nuclear explosion	2. Severe winter storm
3. Supply shortage	3. Water supply disruption	3. Earthquake - moderate
4. Train/truck accident - hazmat	4. Pandemic flu	4. Factory chemical spill
5. Wildfire	5. Earthquake - moderate	5. Cyber attack
<b>Davis</b>	<b>Salt Lake County</b>	<b>San Juan</b>
1. Nuclear explosion	1. Pandemic flu	1. Supply shortage
2. Radiological dispersal device	2. Emergent disease	2. Cyber attack
3. Fire - large scale urban	3. Population displacement	3. Wildfire
4. Earthquake - major	4. Earthquake - major	4. Flood
5. Earthquake - moderate	5. Cyber attack	5. Electrical failure
<b>Southeast</b>	<b>Southwest</b>	<b>Summit</b>
1. Supply shortage	1. Pandemic flu	1. Climate change
2. Cyber attack	2. Communicable disease outbreak	2. Earthquake - major
3. Wildfire	3. Smallpox	3. Pandemic flu
4. Flood	4. Nerve agent	4. Wildfire
5. Electrical failure	5. Pneumonic plague	5. Extreme summer weather
<b>Tooele</b>	<b>TriCounty</b>	<b>Utah County</b>
1. Fire - large scale urban	1. Oil spill	1. Nuclear explosion
2. Earthquake - moderate	2. Flood	2. Pneumonic plague
3. Active shooter	3. Severe winter storm	3. Emergent disease
4. Nerve agent	4. Wildfire	4. Radiological dispersal device

Wasatch	Weber-Morgan	DHHS
5. Nuclear explosion	5. Drought	5. Pandemic flu
1. Wildfire	1. Nuclear explosion	1. Earthquake - major
2. Earthquake - major	2. Earthquake - major	2. Nuclear explosion
3. Active shooter	3. Mass casualty hazmat incident	3. Earthquake - moderate
4. Earthquake - moderate	4. Pneumonic plague	4. Pandemic flu
5. Mass casualty hazMat	5. Industrial plant explosion	5. Emergent disease



**Figure 12.** Number one hazard by jurisdiction, 2024.

**Legend**

-  Wildfire / Largescale Urban
-  Climate Change
-  Train/Truck Accident - Chemical Release
-  Pandemic Flu / Emergent Disease
-  Supply Shortage
-  Nuclear Explosion - 10 Kilotons
-  Oil Spill
-  Earthquake

## Top 20 health hazards in Utah

### Aggregated relative risk scores

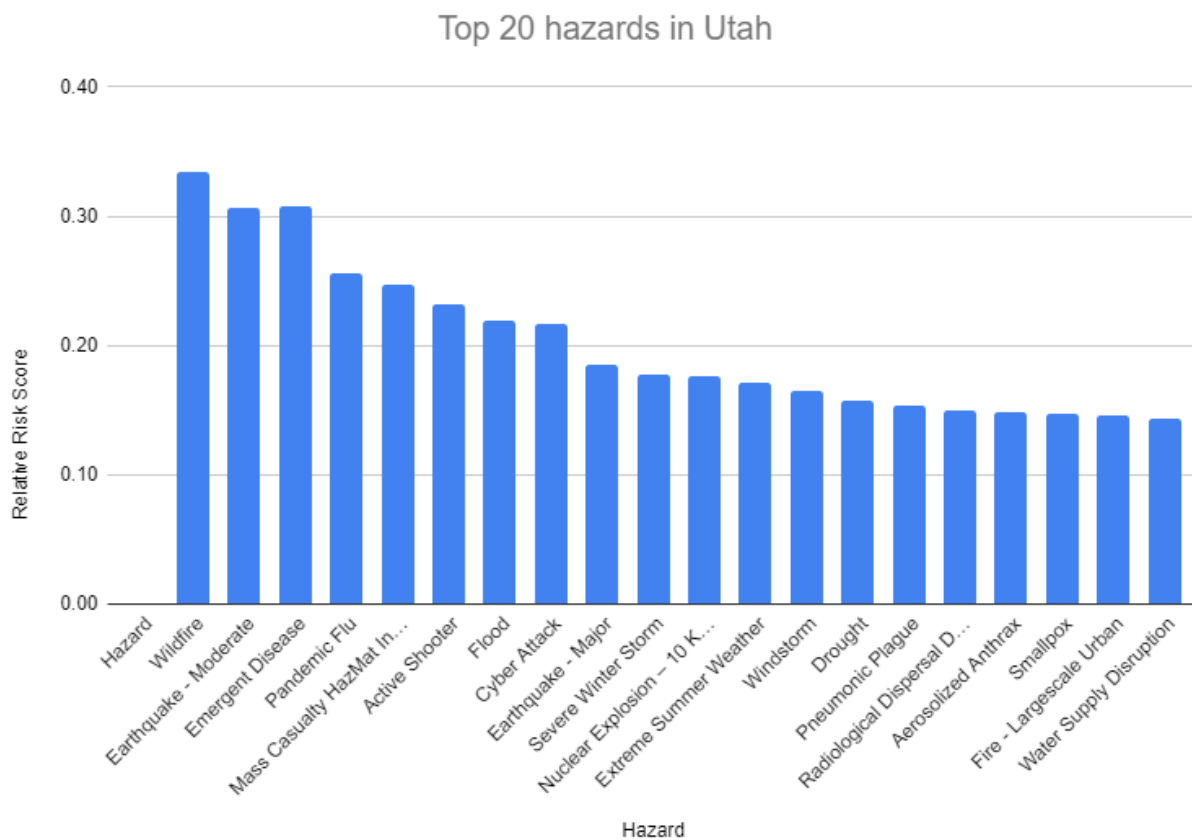
Results from all 13 local health departments, four tribal organizations, and DHHS were averaged to produce an aggregated relative risk score for each hazard. Table 3 shows these scores. For each risk element, such as “probability”, a score of 1.0 is the lowest risk (it is less likely to occur, or less likely to do severe damage) and a score of 4.0 is the highest risk. “Mitigation” is the only risk element where a higher score is desirable, where a score of 4.0 means excellent planning and resources are in place to mitigate the hazard.

**Table 3.** Utah modified hHAP tool aggregated values for top identified hazards

Utah health hazard assessment and prioritization (hHAP) tool									
Aggregated top hazard data from LHD, DHHS, and tribes									
Hazard	Prob-ability	Health severity	Impact to infrastructure				Mitigation		Relative risk score
			Comm-unity	Public health	Health care	Mental health	Your Org.	Partners	
Wildfire	2.80	2.56	2.44	2.35	2.44	2.06	2.10	2.75	<b>0.34</b>
Earthquake - moderate	1.96	2.56	2.55	2.52	2.61	2.51	2.07	2.08	<b>0.31</b>
Emergent disease	2.23	2.58	2.40	2.58	2.71	2.20	2.43	1.85	<b>0.31</b>
Pandemic flu	2.35	2.70	2.39	2.85	3.01	2.34	2.73	2.55	<b>0.26</b>
Mass casualty hazMat incident	1.58	2.87	2.41	2.31	2.71	2.12	1.91	2.47	<b>0.25</b>
Active shooter	2.23	2.60	2.29	1.94	2.62	2.78	1.86	2.47	<b>0.23</b>
Flood	2.71	2.38	2.36	2.40	2.24	2.13	2.13	2.37	<b>0.22</b>
Cyber attack	2.83	2.10	2.33	2.13	2.65	2.00	1.88	2.10	<b>0.22</b>
Earthquake - major	1.27	3.31	3.34	3.32	3.35	3.07	1.98	2.30	<b>0.18</b>
Severe winter storm	3.02	2.23	2.23	1.97	2.32	2.06	2.36	2.65	<b>0.18</b>
Nuclear explosion – 10 kiloton	1.00	3.23	2.72	2.91	2.91	2.95	1.39	1.58	<b>0.18</b>
Extreme summer	2.66	2.17	2.02	1.82	1.81	1.51	1.87	1.83	<b>0.17</b>

weather									
Windstorm	2.68	1.92	2.00	1.74	1.71	1.56	1.87	2.23	<b>0.16</b>
Drought	3.30	2.02	1.93	1.64	1.71	1.36	1.79	1.98	<b>0.16</b>
Pneumonic plague	1.09	2.99	2.38	2.81	2.81	2.57	2.13	1.90	<b>0.15</b>
Radiological dispersal device	1.00	2.58	2.52	2.74	2.65	2.70	1.74	1.84	<b>0.15</b>
Aerosolized anthrax	1.08	2.82	2.41	2.67	2.79	2.38	2.21	2.00	<b>0.15</b>
Smallpox	1.23	2.55	2.02	2.78	2.74	2.28	2.36	1.96	<b>0.15</b>
Fire - large scale urban	1.49	2.96	2.69	2.55	2.78	2.45	1.94	2.25	<b>0.15</b>
Water supply disruption	1.85	2.50	2.47	2.34	2.48	2.10	2.24	2.26	<b>0.14</b>

**Figure 13.** Top 20 hazards in Utah, according to aggregated relative risk score



The graph in figure 13 includes the aggregated relative risk scores for each of the top 20 health hazards from highest to lowest concern. Note that the top three hazards have significantly higher scores than the remaining 17 hazards. These three hazards, wildfire, moderate earthquake, and emergent disease, will be of special significance for statewide planning and preparedness efforts. The other two hazards in the top five, pandemic influenza and mass casualty hazmat incident, will also be important for statewide consideration.

## Aggregated risk score analysis

A brief analysis of the scores for the aggregated risk components of these identified top hazards helps us better understand the challenge they pose to our preparedness and response efforts.

**Health severity.** Major earthquake (3.31), nuclear explosion (3.23), and pneumonic plague (2.99) were the highest-scoring hazards for the health severity risk element. A score of 3.0 represents a “critical” health severity, and a score of 4.0 would represent a “catastrophic” event. The majority (70%) of scores were 2.5 or higher, with only one hazard scoring lower than 2.0. Utah has a limited number of health professionals and hospital beds for the population; therefore, even slightly elevated rates of hospitalizations and deaths are enough to greatly impact the health system of local communities.

### Health system impacts.

- **Public health.** Those hazards predicted to bring the most disruption to the delivery of public health services are: major earthquake (3.32), nuclear explosion (2.91), pandemic flu (2.85), and pneumonic plague (2.81). Some considerations for these scores include public health as the lead response agency for disease-related hazards which requires a shift from other duties to shoulder this responsibility, as well as the extensive focus needed on epidemiological, laboratory, healthcare coordination, supply shortages, and community disruptions such as school closures. A major earthquake or nuclear explosion provides additional complexities through damage or destruction to facilities and equipment, in addition to water, sanitation, and mass fatality issues.
- **Healthcare.** Hazards thought most likely to overwhelm the medical system are similar to those that would overwhelm public health services the most. Aggregated



rating scores are as follows: major earthquake (3.35), pandemic flu (3.01), nuclear explosion (2.91), and pneumonic plague (2.81). The increased rates of hospitalization, extensive reduction in needed medical supplies and equipment, and high likelihood of implementing altered standards of care characteristic of each of the hazards all contribute to these high scores. Other considerations include high staff absenteeism, difficulty obtaining additional medical supplies and equipment due to either supply routes being impassable (following an earthquake) or nationwide shortages (in a pandemic).

- **Mental health.** The highest rates of mental health system disruption belong to major earthquake (3.07), nuclear explosion (2.95), and active shooter (2.78). Given the low availability of mental health services per capita in our state and nation, and the long-lasting effects these hazards can pose on the mental well-being of our residents, it is critical that mental health components are included in preparedness efforts moving forward.

**Mitigation efforts.** Examining lowest scores for mitigation among the top hazards is helpful to identify gaps in our preparedness activities. Low scores for mitigation indicates a lack of planning or other preparedness efforts for a given hazard, so these hazards may warrant attention. The hazards with the lowest self-assessed mitigation scores are: nuclear explosion (1.40), radiological dispersal device (1.74), and drought (1.79). Other low scores included active shooter (1.86), extreme summer weather (1.87), windstorm (1.87), and cyber attack (1.88).

## Recommendations

This section further analyzes and summarizes information from the results section above, and outlines priorities for preparedness funding and activities for the next five years. The priorities outlined in this section are for overall state readiness, and largely for DHHS use. Tribal organizations and local health departments will continue to use their own hazard findings for preparedness priorities. However, it is helpful to understand the priorities of the state as a whole for shared opportunities.

The Jurisdictional risk assessment is completed every five years. Therefore, the recommendations in this section are valid for the years 2024 through 2029.

## State preparedness priorities, 2024-2029

### The “top 5” priority hazards

An analysis of the aggregated data from all jurisdictions who participated in the Jurisdictional risk assessment process, and a consideration for the hazards that appeared as a number one hazard for multiple jurisdictions, points to five hazards that should be considered the priority hazards for overall state preparedness efforts.

These top 5 priority hazards are:

1. Wildfire
2. Earthquake (moderate or major)
3. Emergent disease
4. Pandemic influenza
5. Mass casualty hazmat incident (train or truck accident)

### Jurisdiction #1 hazards

A hazard that scored at the very top for any jurisdiction in the state should be considered a top priority threat for the state as a whole, regardless of how that hazard scored in any other area. Several number one jurisdictional hazards are already counted in the top 5 list above, namely wildfire, earthquake, pandemic influenza, and mass casualty hazmat incident (train or truck accident). Five other hazards were a number one threat for at least one tribal organization or local health department.

These additional priority hazards are:

6. Nuclear explosion
7. Supply shortage
8. Fire—large scale urban
9. Climate change
10. Oil spill

## Overall recommendations

This JRA examined and aggregated scores from the completed modified hHAP tools of all 13 local health departments, four tribal organizations, and DHHS. Even though scores on some hazards varied greatly due to differences in local geography, demography, and preparedness efforts, there were some trends statewide that suggested a more determined focus is necessary to make sure we are better prepared for particular hazards and across certain capabilities.

Local health departments and tribal organizations are encouraged to use their JRA and accompanying PHEP capability assessment findings as a primary source of information to direct local preparedness activities for the next five years. They are also encouraged to use this report to be informed of statewide trends that may provide further insight into specific hazards and capabilities that warrant attention. For example, it is helpful to know if much of the rest of the state is ill-prepared for a particular hazard or has spent little time on a particular capability, or has better preparation efforts in place, so knowledge may be exchanged and activities shared across local boundaries for the benefit of the state as a whole.

Recommendations for the DHHS are to ensure a focus on the “top 5” hazards, as well as the number one hazards for each tribal organization and local health district, over the next five years. It is also important to take note of the hazards with high public health impact, low mitigation scores, and low PHEP capability self-assessment ratings to see what assistance and/or planning activities can be offered in these areas. Targeted planning, training, and exercising activities, focused on the specific hazards and capabilities noted in this report, should do much to close the gaps in these areas over the next several years.

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# JRA statewide report appendix: Community disaster resiliency survey

## Background

Though the jurisdictional risk assessment provides a great deal of information on specific hazards that may threaten Utah communities, it was decided more information would be helpful on how these communities might fare when disaster hits. As part of efforts to better prepare for any disaster or emergency, the Utah Department of Health and Human Services (DHHS) Preparedness and Response Program in partnership with local health department Emergency Response Coordinators (ERCs) developed the Utah Community Disaster Resiliency Survey.

A small workgroup of DHHS Preparedness and Response staff and ERCs met to determine the need and method for a disaster resiliency survey. The joint workgroup researched best-practice tools and consulted with other states to determine a tool that would be simple to implement, brief in the time it required of users, and that would provide information supportive to those responsible for preparedness and response efforts. This research led to two tools that were very helpful in understanding community well-being and disaster resiliency, but that were lengthy in delivery. It was decided that Utah would create its own, abbreviated survey.

The workgroup developed the Utah Community Disaster Resiliency Survey, a simplified merging of the COPEWELL and THRIVE models (see [References](#)). The Utah Community Disaster Resiliency Survey results are meant to provide information to guide preparedness efforts within Utah communities. As we gain a better understanding of what resiliency factors are present and which ones are lacking, we can share these results with policy and decision makers to help shape the outcome of future disasters in our state.



## Methods

The Utah Community Disaster Resiliency Survey was completed by Utah residents individually and anonymously, either on paper or online. There are four sections of the survey, based on four indicators of resilience, namely: opportunity, safety, connectedness, and community involvement. When a community scores high in these areas, it correlates to their ability to be resilient following a disaster (Links et al., 2018).

There are two to three multiple choice questions and one short answer question on the survey for each resiliency indicator. Participants were asked to answer the questions for the community they live or work in. They were able to take the survey more than once if they worked in a different community than where they lived. Participants were asked some broad demographic questions, so their anonymous answers could be aggregated with others from their same community.

The survey was shared with all local health department ERCs and tribal entities, and they were asked to share it within their communities. DHHS also broadly shared the survey through newsletters, list serves, and partners who work and serve in Utah communities.

This report shows results for the state as a whole; however, individual local health departments or tribal jurisdictions can receive aggregated data for their jurisdictions for planning purposes.

## Results

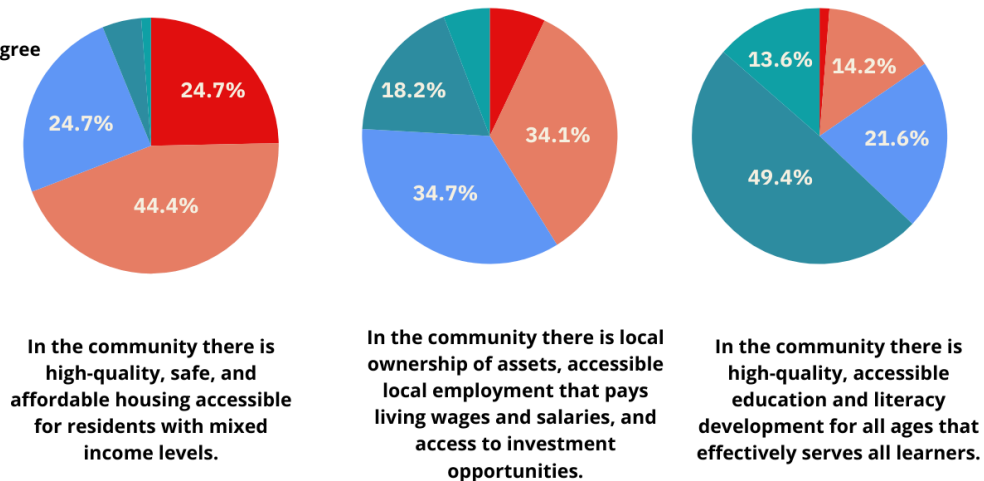
The survey received 162 responses from community members throughout the state. Survey answers are summarized in this report according to the four resilience indicators: opportunity, safety, connectedness, and community involvement. Aggregated multiple choice question answers are shown in the graphs in each section, and a brief summary of short answer question responses is also included.

## Resiliency indicator: opportunity

In a community with a high score for opportunity, all community members have access to equitable opportunities, choices, and resources. The graphic below shows how survey respondents felt about opportunity in their communities. Common themes in the short answers from respondents, when asked about how their community aligns with the theme of opportunity, were that Utah has unaffordable housing and low wages and salaries, which makes it difficult to live and work in their desired communities. Conversely, 63% of respondents agreed or strongly agreed with the statement that there is high-quality, accessible education and literacy development for all ages that serves all learners.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

### Opportunity

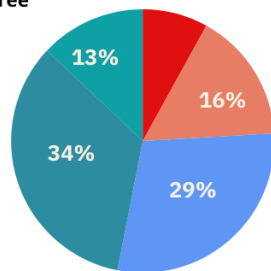


## Resiliency indicator: safety

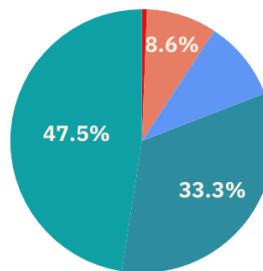
In a community with high safety ratings, community members have a low exposure to risk and have options to respond to emergencies. Survey respondents overall noted they agreed or strongly agreed that there are first responders readily available when needed (81%), and that residents in the community live within close proximity to affordable and high-quality healthcare (49%). Some concerns shared repeatedly in short answer sections included noting the large young and elderly population that may require additional help, language barriers, and some areas with limited access to and/or understaffed emergency medical personnel. Several respondents noted a high level of preparedness activities in their communities, such as fire and active shooter drills.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

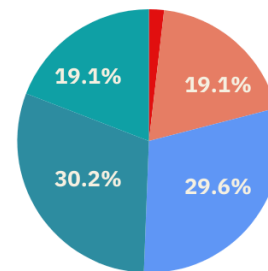
### Safety



**In the community there is availability of safe, reliable, accessible, and affordable ways for people to move around, including public transit, walking, biking, and using devices that aid mobility.**



**There are first responders who are readily available and in close proximity to respond to emergencies within the community.**



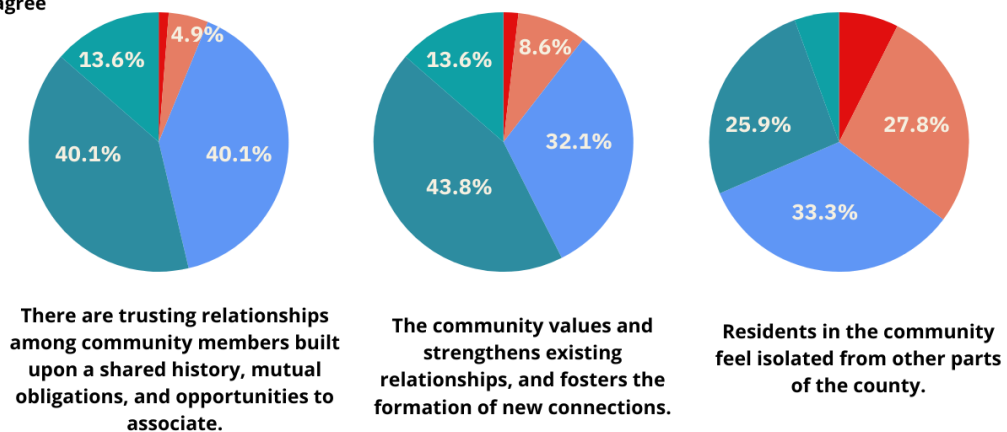
**Residents in the community live within close proximity to affordable and high-quality healthcare.**

## Resiliency indicator: connectedness

In a community with high levels of connectedness, community members have many connections through which they can offer or receive help. Most respondents to the short answer questions on the survey had positive things to say about their communities, including strong community connections, great community support, and a willingness to help each other during an emergency. It should be noted, however, that some did share that they felt isolated. Slightly more than half of respondents to multiple choice questions indicated they felt there were trusting relationships among community members (54%), and that the community values relationships and fosters new connections (57%).

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

### Connectedness

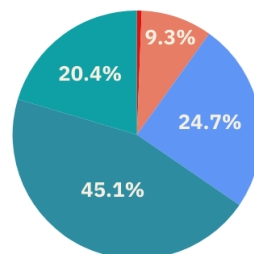


## Resiliency indicator: community involvement

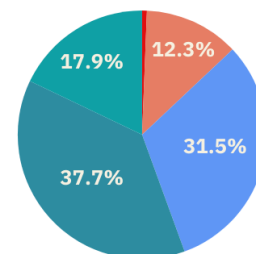
In a community where community involvement is high, the community is active and committed to growing and improving together. In short answer questions, many survey respondents noted there was high community involvement where they lived and worked. They provided ideas to foster even more involvement, such as making sure participation opportunities are accessible to everyone and broadening engagement of the community in emergency planning. But overall, respondents seemed satisfied with this factor. Multiple choice answers indicated that community involvement was evident (66%), and that when a problem occurs the community is able to come together to create solutions (69%).

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

### Community involvement



**Community members have the capacity, desire, and ability to participate, communicate, and work to improve the community. This is evident in volunteerism, involvement in community, religious and/or social organizations, and participation in the political process.**



**When a problem occurs, community members are able to come together and create a solution for the problem.**

## Overall resiliency

The final set of questions in the survey asked respondents to compare the indicators of resiliency in their community, and determine which needed the most improvement and which were the strongest. Overwhelmingly, respondents chose opportunity as the factor that needed the most improvement. And, the majority chose community involvement as the factor that was rated the strongest.

The respective information and data gained from this survey will be shared with local health departments and tribal jurisdictions. It is recommended this information be used, in conjunction with the jurisdictional risk assessment hazard findings, to help determine preparedness efforts moving forward.



## References

The Utah Community Disaster Resiliency Survey was developed from the COPEWELL and THRIVE community assessment tools.

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