Emergency Medical Services and Preparedness in Utah

First Biennial Report 2013-2014

UTAH DEPARTMENT OF HEALTH

INTRODUCTION

Emergency medical services in the United States have improved dramatically since the landmark report, "Accidental Death and Disability: The Neglected Disease of Modern Society," published by the National Academy of Sciences in 1966. Today we can call 911 at any moment and know emergency responders will arrive quickly. The location of a nearby emergency department is now common knowledge among Americans of all walks of life. The remarkable progress in access to emergency care, however, has contributed to a crisis in today's system of emergency medical care.

In 2007, the Institute of Medicine and the Committee on the Future of Emergency Care in the United States Health System published the report, "Hospital-Based Emergency Care: At the Breaking Point." Companion reports about prehospital emergency medical services and the emergency care of children examined the comprehensive scope of the effectiveness of emergency medical services in the United States. Overcrowding in emergency departments and trauma centers is a national problem and impairs the ability of hospitals to respond when time-sensitive medical emergencies occur. Emergency departments, already filled to capacity, are challenged to respond to critical patients with traumatic injuries, heart attacks, and strokes when minutes often mean the difference between life and death. Fragmented emergency medical systems complicate patient care coordination when jurisdictional lines of authority lack effective cross-communication with fire, police, and emergency management, as well as when other municipal, county, and state boundaries are crossed. Providing Emergency Medical Services (EMS) is challenging in rural communities because of increased travel times, staff turnover, and hospital capacity to treat traumatic injuries. EMS agencies are also on the front lines when a mass casualty event strikes and effective response requires sufficient disaster preparedness training and planning. Additionally, emergency care for children presents a unique set of challenges to emergency medical providers because of the differences in the physical development between children and adults.

In Utah, the Bureau of Emergency Medical Services and Preparedness (BEMSP) partners with emergency medical agencies and providers across the state to address critical gaps in the emergency and preparedness medical systems. Working together, we build and strengthen the emergency medical service systems throughout the state guided by the goal of improving Utahn's health outcomes. The present report is the first biennial report published on the status of Utah's emergency medical services and preparedness systems.

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I am excited to present the first Bureau of Emergency Medical Services and Preparedness (BEMSP) 2013-2014 Biennial Report for the State of Utah.

The BEMSP serves as the lead agency for Utah's emergency medical and preparedness systems by promoting effective and coordinated statewide systems committed to protecting the health of the people of Utah. Together with hundreds of health care organizations and thousands of medical professionals in Utah's cities and communities our common unifying goal is ensuring emergency medical and preparedness services that safeguard Utahns' health by reducing morbidity and mortality. I am honored and humbled to have the privilege of working with so many dedicated professionals committed to the cause of health in emergency medical care and response situations.

This first report provides an overview describing the work and statewide systems of emergency medical services and emergency health preparedness in Utah. Readers of the report will gain a more comprehensive understanding and greater appreciation of the duties, performance, and complexity of the emergency medical and health preparedness systems in our state.

Paul R. Patrick
Director of the Bureau of Emergency Medical Services and Preparedness
Utah Department of Health

EXECUTIVE SUMMARY

Following the enactment of the Utah Emergency Medical Services System Act in 1999, emergency medical service systems have continued to develop in Utah. In 2014, regional systems of trauma and emergency medical care are organizing around trauma centers' leadership to improve local coordination with hospitals, medical dispatch centers, and EMS agencies that provide emergency medical services in seven Utah regions. As trauma care and EMS providers in each region meet together to identify and address regional trauma care challenges, the statewide system of emergency medical care strengthens. Developing efficient community-based systems of emergency care relies on establishing care coordination policies and practices that formalize the patient care decision-making processes and establish an overt platform for defending decisions that allow necessary connections to maintain across different-affiliated agencies, hospitals, and trauma centers. Organized community-based emergency medical systems improve patient health outcomes for severe injuries, but also for patients with any time-sensitive medical emergencies that require a high standard of rapid medical coordination across various providers. Established communication pathways allow regional and local problems to be quickly identified and addressed as they arise. When traumatic injuries, heart attacks, strokes, and other time-sensitive emergencies strike, well-organized emergency medical services save lives and prevent morbidity. This life-saving purpose unites Utah's complex system of emergency medical and trauma care services.

Likewise, emergency health preparedness has progressed in Utah since the Emergency Management Act of 1981. The events of September 11, 2001 and hosting the 2002 Winter Olympics in Salt Lake City just a few months later, advanced emergency preparedness capability substantially in our state. Today in Utah, the status of state, regional, and local emergency preparedness networks remains vigilant, and the systems activate when large-scale emergencies and trainings occur. Clear and detailed plans for emergency response are in place, and as lessons continue to be learned across cities and communities in our country, Utah's plans will continue to evolve to enhance the coordination of agencies, decision-making, personnel, and information. Representatives from hospitals, emergency medical agencies, and health care organizations meet regularly throughout Utah's cities and communities to prepare for the demands of emergency medical surge when many patients will require medical care at the same time. Efficient coordination of medical resources and information in a large-scale medical emergency saves lives, so Utah has built networks and information systems to rapidly coordinate resources and information within the state and with the Centers for Disease Control and Prevention.

BUREAU OF EMERGENCY MEDICAL SERVICES AND PREPAREDNESS OVERVIEW

When someone in Utah has a medical emergency and dials 911, one of 37 emergency medical dispatch centers in the state answers the call and relays directions to emergency medical responders. One or more of 156 licensed and designated agencies in Utah activates and responds to the emergency either driving or flying to the scene. Emergency medical providers in the state cover 82,170 square miles serving a total population of 2,855,287. About 75% of Utah's population resides along the Wasatch Front on less than 5% of the state's geographic landscape. During transport to one of 44 hospital destinations in Utah, paramedics and emergency medical technicians provide emergency medical care to the patient. In 2014, there are 5,043 certified providers of prehospital emergency medical services in Utah. The numbers and types of agencies, personnel, hospitals, and geographic locations create a complex system of interacting networks providing emergency medical services to Utahns. Nonetheless, a high standard of emergency medical care remains constant across the entire state system where timely response is often critical, and efficient coordination among agencies saves lives.

The Bureau of Emergency Medical Services and Preparedness (BEMSP) exists to promote a statewide medical system of emergency and trauma care to reduce morbidity and mortality through prevention, awareness, partnership, and quality intervention. The BEMSP is the lead agency for Utah's emergency medical system, and functions as a leadership team assuring all Utahns of a quality emergency medical system in the state of Utah. This includes emergency medical services for individual casualty as well as mass casualty events encompassing all conditions, environmental or manmade, that have the potential to cause injury, illness, or death.

Housed within the Utah Department of Health (UDOH) Division of Family Health and Preparedness, the BEMSP is comprised of two sections that oversee the Emergency Medical Services (EMS) System, and the Emergency Health Preparedness (EHP) system. To ensure constituent input, the BEMSP has three statutory committees, three subcommittees, and multiple task forces. The core values of the BEMSP are: "protection of the public, education, active listening, cost effectiveness, trust, assurance, flexibility, responsiveness, service, honesty, support, leadership, communications, integrity, team work, quality, customer focus, openness, and respect."

EMERGENCY MEDICAL SERVICES (EMS)

The foundation of the EMS system in Utah is evidence-based medicine guided by the highest standards of medical practice, education and training. Medical direction and advisement for EMS is provided by Peter Taillac, M.D., supporting policy development, hands-on EMS training, and medical practice oversight for the statewide EMS system over the past decade. During this time, Dr. Taillac helped improve care for stroke patients by supporting designated Primary Stroke Centers in Utah to partner with smaller facilities (Stroke Receiving Facilities) that adopt a standardized, evidence-based approach to emergency stroke care. These hospitals are designated as "stroke ready" to receive patients with symptoms of an acute stroke. The result is better stroke care closer to home, in an inclusive system that encourages participation by all hospitals in partnership with their local EMS agencies. In 2013, more than 90% of Utah's population was within 30 minutes of a Stroke Receiving Facility or Primary Stroke Center.

Over the past few years, advanced life support EMS agencies throughout the state have started using field electrocardiogram (ECG) machines. A network of advanced cardiac centers has been identified and designated as STEMI/Percutaneous Cardiac Intervention (PCI) Centers. EMS is able to transmit the results of the field ECGs to these specialized centers to speed up care for victims of heart attack or cardiac arrest. These hospitals have committed to meeting strict national guidelines mandating availability of advanced emergency cardiac care 24 hours a day, 365 days a year.

The annual EMS Medical Director's Workshop provides a valuable forum for EMS physician medical directors from across the state to come together to discuss current best practices and challenges for EMS agencies. This forum includes representatives from both urban and rural EMS agencies. It allows the BEMSP to update physician medical directors on new initiatives and solicit feedback on current and future policies and programs. In addition, the BEMSP has drafted the first version of the Utah State EMS Protocol Guidelines to provide a definitive resource for standing orders for field care by EMS providers. The guidelines describe EMS protocols for trauma patient triage and care, cardiac care, and general medical care. A panel of experienced EMS physicians and field prehospital providers developed these guidelines based on the best and most current medical evidence. They are designed to be used by EMS agencies statewide as they develop their own local protocols and standing orders. They will be updated regularly as new procedures and techniques advance.

A. Emergency Medical Service Organizations, Agencies, and Systems

The lifeblood of EMS is the agencies and organizations that triage emergency calls, respond to emergency situations, provide life support, and transport injured patients from anywhere in the state of Utah. The network of collaborating agencies distributed throughout Utah's cities and communities includes medical dispatch centers, medical quick response units, ambulance agencies, air ambulance agencies, fire departments, and hospital emergency departments. The state EMS Systems program designates nontransporting agencies, licenses transporting agencies, assigns vehicle permits, facilitates disaster planning and preparedness for EMS providers, develops policy rules and guidelines, and coordinates state EMS committee and subcommittee participation, rural leadership, and critical incident stress management services. The state EMS Systems program works to improve and support effective operation of prehospital medical services in Utah.

Three regional consultants serve as liaisons for the BEMSP to facilitate coordination with local and county EMS agencies throughout the state. Regional consultants attend local EMS councils, regional health care coalition meetings, and local emergency planning committee meetings. Regional consultants' service areas align with Utah's Hospital Coalition Regions. Utah's EMS Systems program and regional consultants help manage changing circumstances that routinely arise concerning EMS agency geographic location, organizational structure, staffing needs, training needs, staff size, geographical service area size, terrain, funding, licensure, compliance, and local stakeholder support.

Up-to-date lists of Utah's licensed (i.e., transporting) and designated (i.e., nontransporting) EMS agencies, and emergency medical dispatch agencies are available on the BEMSP website (http://health.utah.gov/ems/providers/). Figures 1 and 2 show the locations of EMS and EMD agencies in Utah. Figure 1 includes information about the number of permitted ground ambulances in each Utah county including transport and nontransport vehicles. There are 12 Utah air-EMS agencies licensed to pick up and deliver patients across state lines. Four air-agencies are based in Utah and eight in surrounding states. Figure 1 provides a statewide perspective of agencies' locations while Figure 2 shows a close-up view of the detail along the urban Wasatch Front.

Emergency Medical Service and Dispatch Agencies in Utah.
(The number behind each county name is the number of state-permitted EMS ground vehicles in the county)

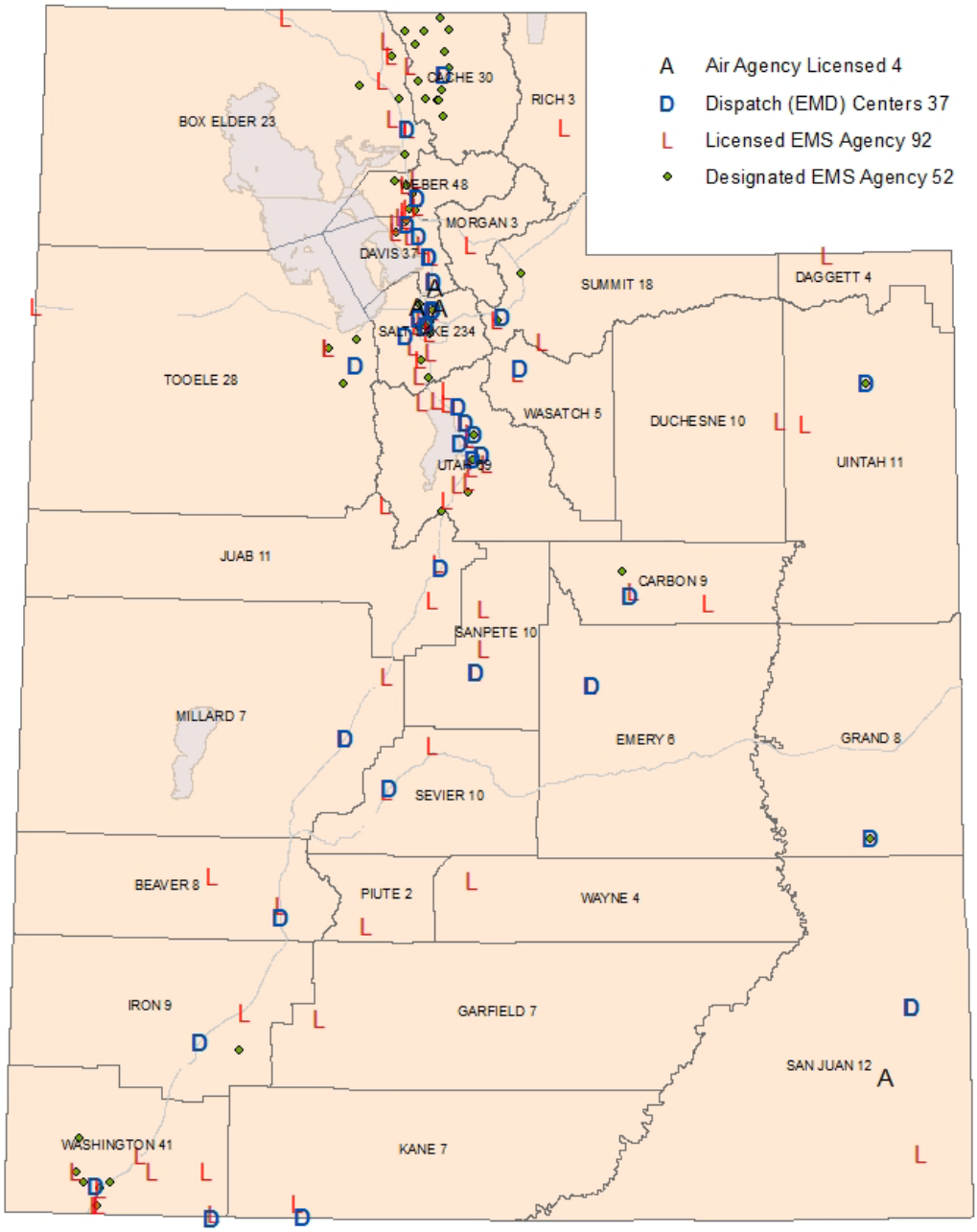


Figure 1.

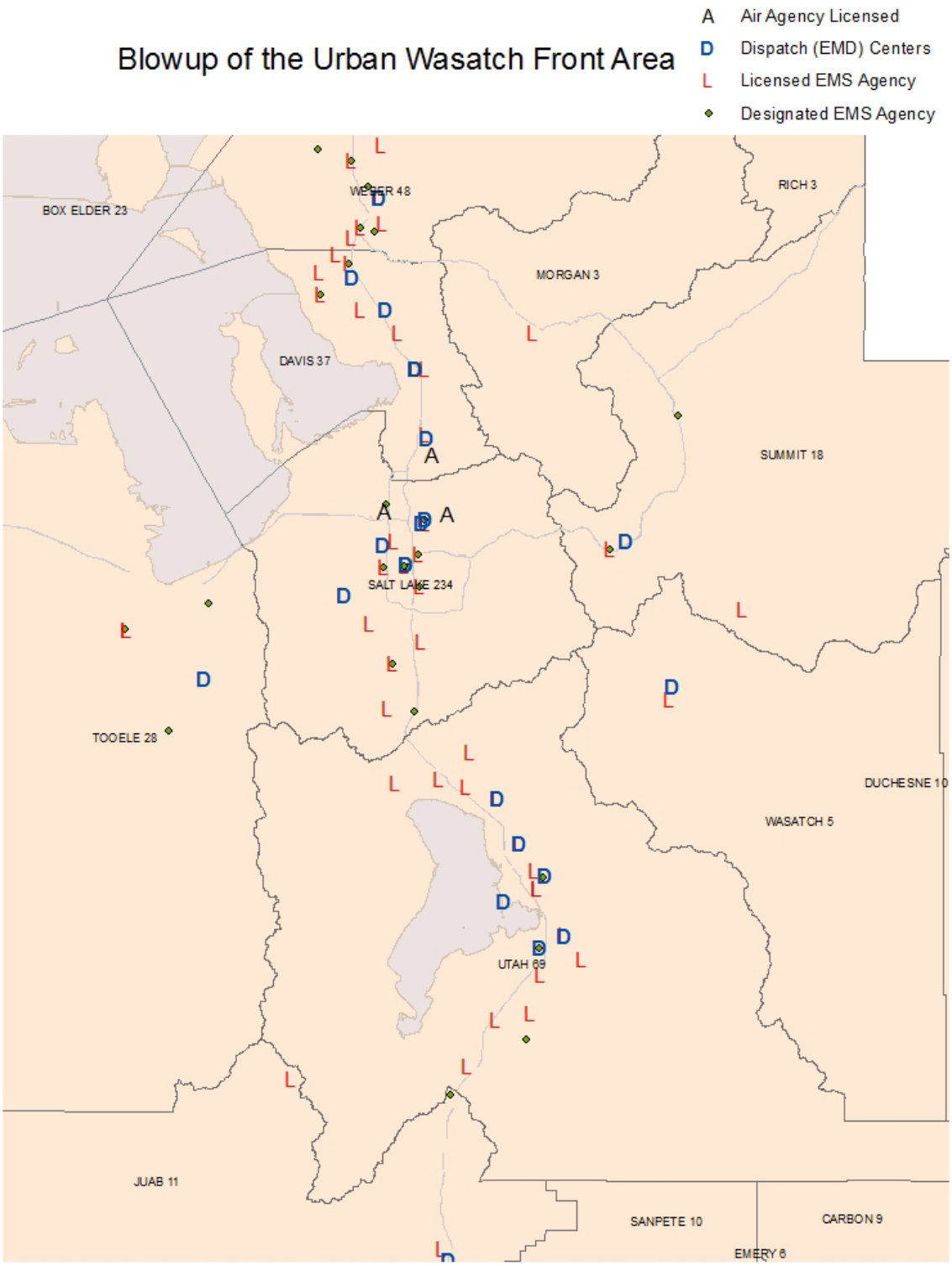

Blowup of the Urban Wasatch Front Area
A Air Agency Licensed
D Dispatch (EMD) Centers
L Licensed EMS Agency
Designated EMS Agency
BOX ELDER 23
WEBER 48
RICH 3
MORGAN 3
DAVIS 37
SUMMIT 18
SALT LAKE 234
TOOELE 28
DUCHESNE 10
WASATCH 5
UTAH 69
JUAB 11
SANPETE 10
CARBON 9
EMERY 6

Figure 2.

In an emergency the initial problem is conveyed through a call to a 911 center. Medical dispatch identifies the problem, determines appropriate resources to send, coordinates responding agencies, offers patient care instructions, and ensures scene safety. Stressful situations occur frequently in medical dispatch agencies when quick, accurate decisions and efficient coordination of resources can save lives. Dispatch centers typically operate with limited funding, frequent staff turnover and regular training. The BEMSP monitors medical dispatch center performance and a task force works to improve challenges faced by medical dispatch centers. As of May 2014, Utah has 37 designated medical dispatch centers.

Utah offers outdoor adventurers high mountain ranges as well as stunning, arid desert landscapes. The wide variety of world-class terrain draws people from around the world to explore, or live in, remote places. The EMS Systems program designates Quick Response Units (QRUs) to send to a wide array of patient scenes throughout the state. QRUs work closely with licensed ambulance providers to ensure the fastest patient care possible. Designated QRUs staff EMTs or paramedics to dispatch to the scene, often prior to the arrival of an ambulance. The EMS Systems staff frequently consult with local responders to facilitate seamless patient care by coordinating with local medical direction and protocols. Utah has 52 designated QRUs in 2014 that employ 120 inspected and permitted vehicles.

Often considered the vital link for patient outcomes in emergencies, ambulance agencies administer rapid patient assessment, deliver patient care, and provide patient transport to the appropriate receiving facility. Licensure of ambulance services in Utah is currently transitioning to licensing guidelines consistent with national standards. Paramedic level services remain unchanged, but former intermediate level services are transitioning to advanced licensure levels as staffing certifications are similarly converted. Basic EMT licenses will be converted to EMT licenses. As populations and patient care expectations increase, licensed agencies have been allowed to offer higher skill sets associated with higher licensure levels. Many agencies have moved from the previous Intermediate/Advanced levels to paramedic services. Utah has 92 licensed ground ambulance agencies with 430 permitted vehicles. Licensing, re-licensing, operations, and inspections are all directed by the EMS Systems program.

Air ambulance services are also a part of the EMS Systems program to facilitate licensure, re-licensure, and efficient response coordination. The air ambulance industry provides specialized emergency medical skills and flight capabilities within a highly competitive business model. Utah has two large metro air

ambulance providers, and ten rural providers based in and outside the state for a total of 12 licensed air ambulance agencies providing services to Utahns. Licensing criteria and evaluation of accreditation is complex and requires frequent monitoring.

National and world events continue to challenge EMS systems to adapt. Planning needs and requirements for mass casualty and environmental incidents force local responders to evaluate local resources and disaster response capacity. Utah's EMS Systems program commits time, effort, and funding to ensure gaps in patient care are identified, and crisis care is prepared for events that might overwhelm local response capabilities. The BEMSP and EMS Systems program manages five strike teams comprised of nine EMTs or paramedics, supply trailers, specialized training, and resource coordination to augment local prehospital responses. Strike teams frequently deploy to exercise and train ensuring a proficient and constant state of readiness for disasters. Strike team members fill key roles in statewide disaster responses for patient triage and initial treatment in the National Disaster Medical Services (NDMS) response for Utahns.

Workplace stress and fatigue is a common denominator for all medical responders. A study conducted by Utah Valley University found that about one-third of emergency responders eventually leave their positions due to the consequences of recurring emotional stresses and cumulative fatigue. The EMS Systems program manages the state Critical Incident Stress Management (CISM) program to aid all first responders (i.e., law enforcement, fire, dispatch, EMS, search and rescue, ski patrol, and hospital ED staff). CISM has conducted 39 post-traumatic event debriefings, 11 educational presentations, one-on-one consulting, and spousal debriefings, reaching 930 individuals directly. Additional outreach includes new member trainings, regional team meetings, and annual training seminars supporting appropriate intervention for responders. CISM services are free-of-charge to first responders. The CISM team is comprised of volunteer mental health professionals and peers who freely commit their own time and energy to the cause of emergency medical health and strength in Utah.

B. Specialty Care Systems

Time-sensitive acute medical emergencies can result in death or severe disability in a matter of minutes. Three unique programs in Utah have been created to identify, triage and treat time-sensitive medical emergencies quickly and effectively to control the consequences of three leading causes of death and disability among Utahns: traumatic injury, stroke and heart attack. These three programs or systems of

time-sensitive medical care depend on rapid coordination throughout the emergency medical response, triage, transport and treatment phases of care.

All three systems of time-sensitive medical care rely on efficient communication beginning with emergency medical dispatcher's and their ability to coordinate with the appropriate EMS agency responding to meet the medical needs of the patient(s) at the scene. Once they arrive at the scene, the EMS responders triage the patient(s) and determine stabilization needs and transport destination. For the patient suffering a traumatic injury from a penetrating, blunt, or burning force, transportation to the appropriate Utah-designated trauma center is determined by distance, trauma center level, and severity-of-threat to life or limb. Figure 3 shows the locations and levels of designated trauma centers in Utah. For the patient suffering a cerebrovascular accident or stroke resulting from an ischemic blood flow blockage, transportation to the nearest Utah-designated primary stroke center or stroke receiving facility depends on distance and stroke center designation. Figure 4 shows the locations of stroke centers in Utah. When the EMS responder uses a 12-lead electrocardiogram (ECG) to identify a patient suffering a severe form of heart attack known as ST-elevation myocardial infarction (STEMI) where blood flow is completely and suddenly blocked in an artery of the heart, the patient is rushed to the nearest Utah-designated STEMI center capable of providing percutaneous cardiac intervention (PCI) to reopen the blocked artery by inserting a balloon and stent at the site of the blockage to reestablish blood flow to the heart. Figure 5 shows the locations of STEMI/PCI centers and 12-lead ECG equipment in Utah.

Traumatic Injury. To improve trauma patient health outcomes in Utah, regional systems of trauma and emergency medical care are starting to organize in 2014 around trauma center's leadership. When a person suffers a traumatic injury, medical care decisions are made for the patient. At this critical time a patient does not have a voice to freely choose what care he or she will receive, or who will provide the care. Regional systems of trauma care can establish local policies with respect to local circumstances and resources that influence patient care decisions including patient triage, transport destination, transfer, and hospital bypass. Organized local trauma systems provide a professional forum where EMS agencies, hospitals, and trauma centers can use surveillance-related medical evidence to advocate for policies that support decisions based on patient medical need. Local trauma systems provide a forum to also discuss the regional trauma care system and appropriate patient care distribution and triage to reduce overcrowding in emergency departments. A coordinated local trauma

system can ensure that severely injured patients get the best and quickest care available, while patients that do not have life-threatening or -disabling conditions can often be cared for closer to home.

As trauma and EMS providers in seven Utah regions organize and meet together regularly to collectively address local and regional trauma care needs and challenges beyond the boundaries of their individual agencies, the overall system of emergency medical care and response strengthens across Utah's communities, towns, and cities. Organizing regional systems of trauma care facilitates efficient coordination among multiple agencies, hospitals, and trauma centers to provide timely medical care for patients with life-threatening injuries, but also, patients with any other time-sensitive medical emergencies that require a high standard of rapid medical coordination across multiple interacting agencies. Established regional communication networks allow regional and local problems to be quickly identified and addressed when they arise. In each Utah region multiple agencies and numerous personnel provide emergency medical care from the 911 call to the on-scene life support to the medical care in the hospital emergency department and trauma center. When time-sensitive emergencies occur and Utahns experience traumatic injuries, heart attacks, and strokes, having well-organized emergency medical services ensures a strong, efficient system focused together on the common goal of Utahn's health outcomes.

Utah Code Title 26 Chapter 8a section 250 directs the BEMSP to establish a statewide trauma system focused on improving patient health outcomes. Utah's Trauma System Advisory Committee (TSAC) includes representatives from urban and rural trauma centers across the state. Based on direction provided by the TSAC, Utah monitors and tracks ten trauma audit filters designed to identify trauma patients who did not meet an ideal expectation of trauma care. The results of these audit filters will be shared with each of the seven regional trauma systems for regional quarterly patient reviews to identify opportunities to make changes in EMS' policy and practice that can improve patient care in the region and local communities. State, regional and local leadership to improve trauma care comes from our trauma centers in the state. Trauma center leadership plays a key role in medical direction and convening hospitals, EMS agencies, and dispatch centers in the region to meet together quarterly for trauma system reviews to discuss results of the trauma audit filters and identify any needed changes in patient care protocols and policies. Figure 3 shows a map of designated trauma centers in Utah.

Designated trauma centers provide specialized care for patients who suffer traumatic injuries, in contrast to patients who are sick or ill. Level 1 trauma centers provide the highest level of surgical care to trauma patients, and being treated in these centers increases chances of survival for patients suffering severe injuries. The American College of Surgeons verifies the presence of required resources, staffing, and patient volume so the State of Utah can designate and recognize specific medical facilities capable of providing specialized trauma care. Utah has three Level 1 trauma centers including Intermountain Medical Center, University of Utah Health Care, and Primary Children's Hospital. Each of these centers provides 24-hour access to a full range of trauma specialists and equipment. They also conduct research, provide education and training, and act as a referral resource for nearby communities and regions. Operating a trauma center is extremely expensive which limits the number of Level 1 and 2 trauma centers in Utah. There are three Level 2 trauma centers in Utah including Ogden Regional Medical Center, McKay-Dee Hospital, and Utah Valley Regional Medical Center. In total, 19 designated trauma centers Levels 1-5 provide trauma care in Utah.

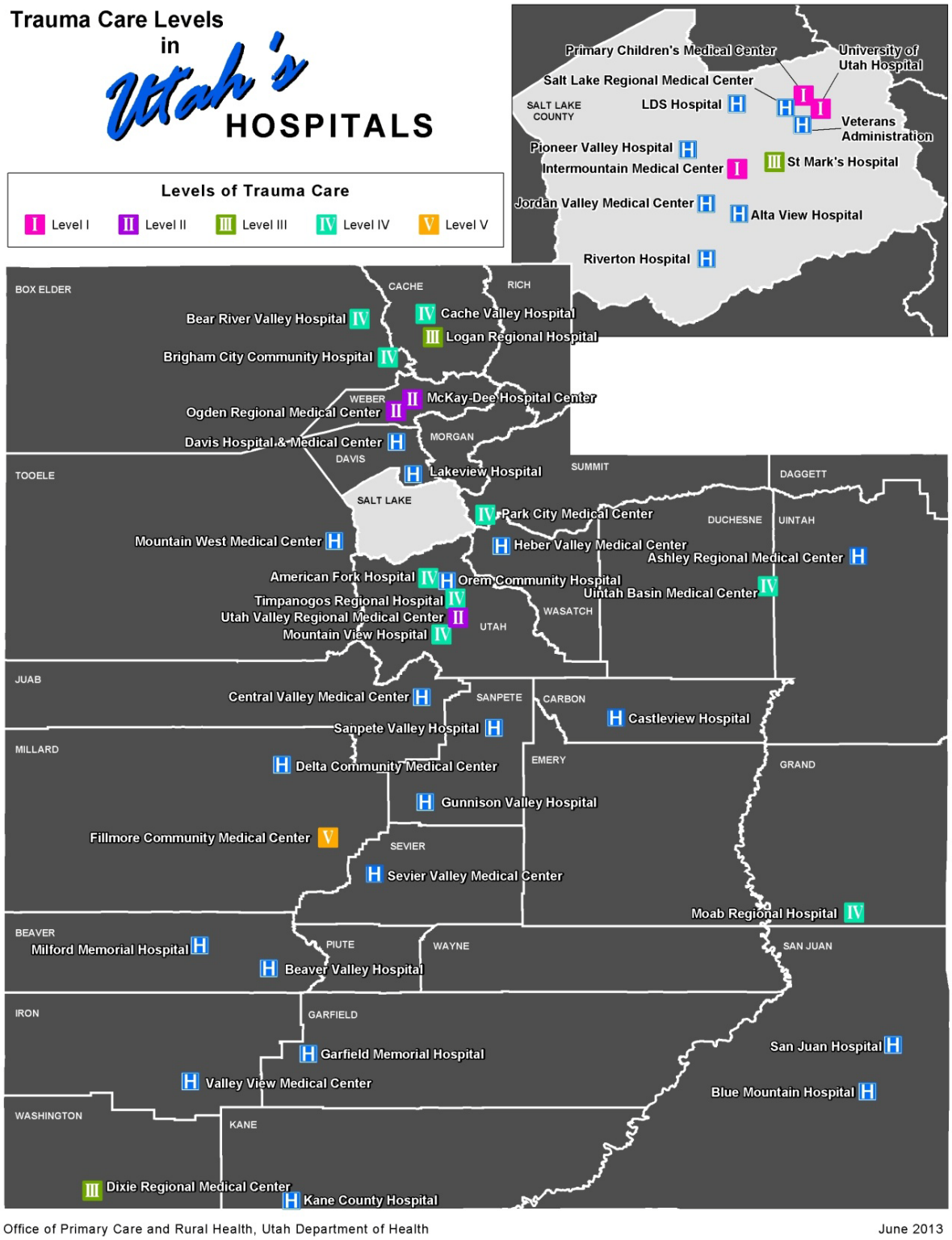

Trauma Care Levels in Utah's HOSPITALS
Levels of Trauma Care
I Level I
II Level II
III Level III
IV Level IV
V Level V
Primary Children's Medical Center
University of Utah Hospital
Salt Lake Regional Medical Center
SALT LAKE COUNTY
LDS Hospital
Veterans Administration
Pioneer Valley Hospital
Intermountain Medical Center
St Mark's Hospital
Jordan Valley Medical Center
Alta View Hospital
Riverton Hospital
BOX ELDER
CACHE
RICH
Bear River Valley Hospital
Cache Valley Hospital
Logan Regional Hospital
Brigham City Community Hospital
WEBER
McKay-Dee Hospital Center
Ogden Regional Medical Center
Davis Hospital & Medical Center
MORGAN
DAVIS
TOOELE
Lakeview Hospital
SUMMIT
DAGGETT
SALT LAKE
Park City Medical Center
DUCHESNE
UINTAH
Mountain West Medical Center
Heber Valley Medical Center
Ashley Regional Medical Center
American Fork Hospital
Orem Community Hospital
Uintah Basin Medical Center
Timpanogos Regional Hospital
Utah Valley Regional Medical Center
WASATCH
UTAH
Mountain View Hospital
JUAB
Central Valley Medical Center
SANPETE
CARBON
Castleview Hospital
Sanpete Valley Hospital
MILLARD
Delta Community Medical Center
EMERY
GRAND
Gunnison Valley Hospital
Fillmore Community Medical Center
SEVIER
Sevier Valley Medical Center
Moab Regional Hospital
BEAVER
Milford Memorial Hospital
PIUTE
WAYNE
SAN JUAN
Beaver Valley Hospital
IRON
GARFIELD
Garfield Memorial Hospital
San Juan Hospital
Valley View Medical Center
Blue Mountain Hospital
WASHINGTON
KANE
Dixie Regional Medical Center
Kane County Hospital
Office of Primary Care and Rural Health, Utah Department of Health
June 2013

Figure 3.

Stroke. Utah's third leading cause of death is stroke, accounting for 45.7 deaths per 100,000 people in the state. Stroke sends more than 3,200 people each year to Utah's emergency rooms. There are two main types of stroke. Hemorrhagic strokes occur when blood bleeds openly into brain tissue. Ischemic strokes are caused when a clot blocks or restricts blood flow to the brain. Ischemic strokes account for more than 85% of all strokes and are treatable by thrombolytic therapy if the patient is seen within four hours from the time blood flow was blocked. Knowing the signs and symptoms of stroke can be the difference between life, severe disability, and death.

Primary stroke centers (PSC) are hospitals that have been certified by The Joint Commission as specialized centers providing the highest level of comprehensive stoke care. This includes advanced time-critical emergency stroke care with specialized radiology, neurology, and neurosurgery expertise, as well as complete inpatient treatment and outpatient rehabilitative programs.

Stroke receiving facilities (SRF) are hospitals which have procedures, equipment, and protocols in place to provide time-critical emergency stroke care, in consultation with one of the PSCs. Some also provide inpatient and rehabilitative care for stroke patients. These hospitals have been verified by the Utah Department of Health and the Utah Hospitals and Health Systems Association (UHA) as meeting the criteria to participate in the Utah Stroke System to receive stroke patients by EMS. There are eight primary stroke centers and 20 stroke receiving facilities in Utah which have been designated as stroke-ready to treat the acute stroke patient. Figure 4 shows a map of Utah's stroke centers.

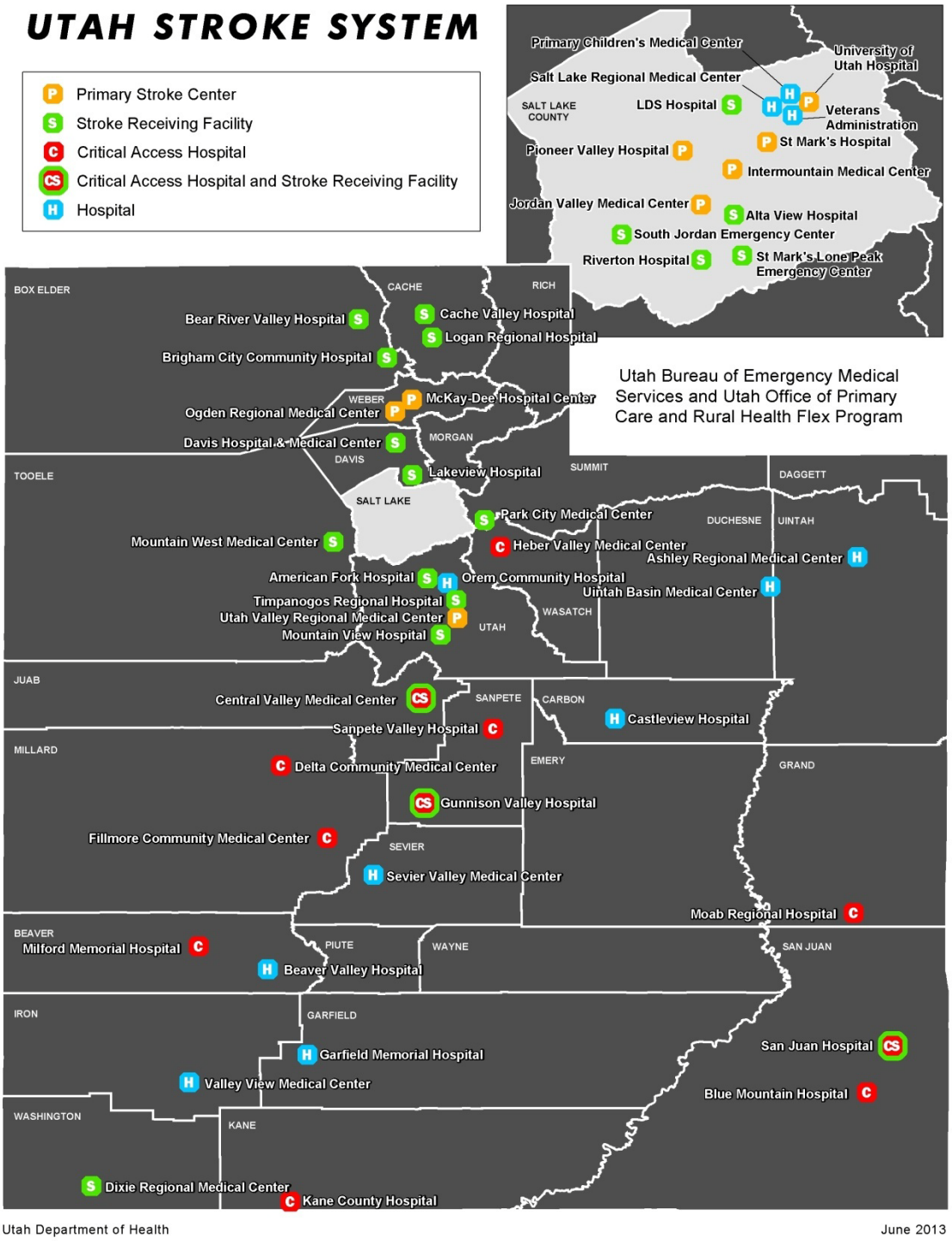

UTAH STROKE SYSTEM
Primary Stroke Center
Stroke Receiving Facility
Critical Access Hospital
Critical Access Hospital and Stroke Receiving Facility
Hospital
Primary Children's Medical Center
University of Utah Hospital
Salt Lake Regional Medical Center
SALT LAKE COUNTY
LDS Hospital
Veterans Administration
St Mark's Hospital
Pioneer Valley Hospital
Intermountain Medical Center
Jordan Valley Medical Center
Alta View Hospital
South Jordan Emergency Center
Riverton Hospital
St Mark's Lone Peak Emergency Center
BOX ELDER
CACHE
RICH
Bear River Valley Hospital
Cache Valley Hospital
Logan Regional Hospital
Brigham City Community Hospital
WEBER
McKay-Dee Hospital Center
Ogden Regional Medical Center
Davis Hospital & Medical Center
MORGAN
DAVIS
Lakeview Hospital
SUMMIT
DAGGETT
TOOELE
SALT LAKE
Park City Medical Center
DUCHESNE
UINTAH
Mountain West Medical Center
Heber Valley Medical Center
Ashley Regional Medical Center
American Fork Hospital
Orem Community Hospital
Uintah Basin Medical Center
Timpanogos Regional Hospital
Utah Valley Regional Medical Center
WASATCH
Mountain View Hospital
UTAH
Utah Bureau of Emergency Medical Services and Utah Office of Primary Care and Rural Health Flex Program
JUAB
Central Valley Medical Center
SANPETE
CARBON
Castleview Hospital
Sanpete Valley Hospital
MILLARD
Delta Community Medical Center
EMERY
GRAND
Gunnison Valley Hospital
Fillmore Community Medical Center
SEVIER
Sevier Valley Medical Center
Moab Regional Hospital
BEAVER
Milford Memorial Hospital
PIUTE
WAYNE
SAN JUAN
Beaver Valley Hospital
IRON
GARFIELD
Garfield Memorial Hospital
San Juan Hospital
Valley View Medical Center
Blue Mountain Hospital
WASHINGTON
KANE
Dixie Regional Medical Center
Kane County Hospital
Utah Department of Health
June 2013

Figure 4.

Utah STEMI System. ST Elevation Myocardial Infarction (STEMI) is a time-critical life-threatening condition where blood flow is blocked in the heart. Immediate recognition and treatment are critical to optimal patient outcomes. Many cities and regions across the country have developed formal systems to facilitate the care of these patients. Since 2009, the BEMSP and the UHA have partnered to develop a system for Utah, enlisting the expertise of a broad range of experts in emergency cardiac care representing all of the hospital systems statewide. This group includes service-line administrators, cardiologists, emergency physicians, EMS personnel, and the American Heart Association. The goal is to utilize nationally-accepted best practices to develop a system designed to speed the recognition and treatment of STEMI patients who activate the EMS system.

STEMI/PCI Centers have agreed to an integrated and standardized system of STEMI care linking EMS, emergency departments, and cardiac catheterization laboratories. This will enable care to be provided as a coordinated team to ensure that STEMI patients are rapidly identified in the field and transported to a facility best prepared to treat them, preferably one that can provide definitive PCI. Over the past few years, advanced life support EMS agencies throughout the state have started using field electrocardiogram (ECG) machines. EMS responders are able to transmit the results of the field ECGs to these specialized centers to speed up care for victims of heart attack or cardiac arrest. These hospitals have committed to meeting strict national guidelines mandating availability of advanced emergency cardiac care 24 hours a day, 365 days a year. Utah has 18 cardiac catheterization laboratories and 15 are staffed 24-hours a day, seven days a week. STEMI Center locations and ECG areas are shown in Figure 5.

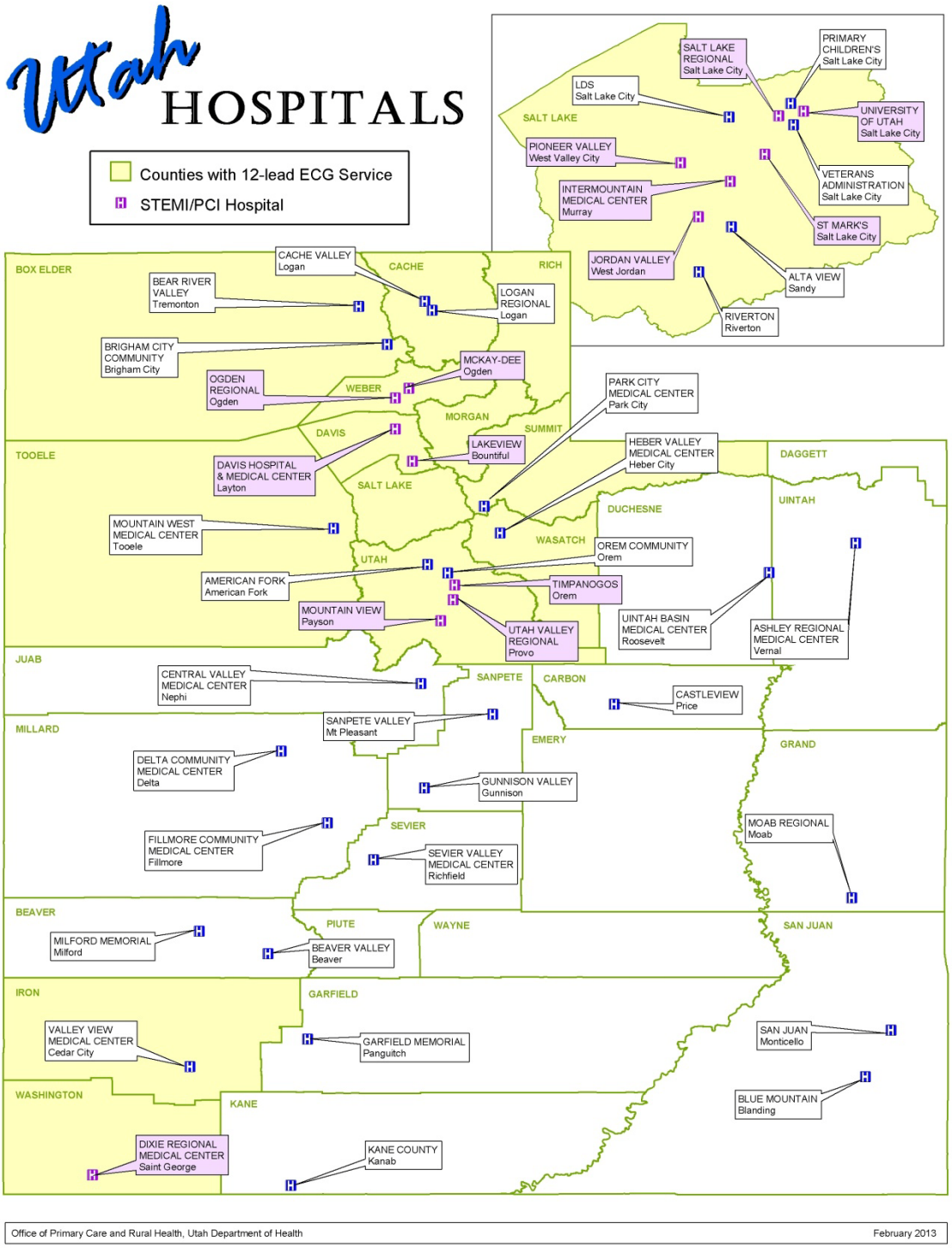

Utah HOSPITALS
Counties with 12-lead ECG Service
STEMI/PCI Hospital
SALT LAKE
SALT LAKE REGIONAL Salt Lake City
PRIMARY CHILDREN'S Salt Lake City
LDS Salt Lake City
UNIVERSITY OF UTAH Salt Lake City
PIONEER VALLEY West Valley City
VETERANS ADMINISTRATION Salt Lake City
INTERMOUNTAIN MEDICAL CENTER Murray
ST MARK'S Salt Lake City
JORDAN VALLEY West Jordan
ALTA VIEW Sandy
RIVERTON Riverton
BOX ELDER
CACHE
RICH
CACHE VALLEY Logan
BEAR RIVER VALLEY Tremonton
LOGAN REGIONAL Logan
BRIGHAM CITY COMMUNITY Brigham City
MCKAY-DEE Ogden
OGDEN REGIONAL Ogden
WEBER
MORGAN
SUMMIT
PARK CITY MEDICAL CENTER Park City
DAVIS
LAKEVIEW Bountiful
TOOELE
DAVIS HOSPITAL & MEDICAL CENTER Layton
HEBER VALLEY MEDICAL CENTER Heber City
DAGGETT
SALT LAKE
UINTAH
DUCHESNE
MOUNTAIN WEST MEDICAL CENTER Tooele
WASATCH
OREM COMMUNITY Orem
UTAH
AMERICAN FORK American Fork
TIMPANOGOS Orem
MOUNTAIN VIEW Payson
UINTAH BASIN MEDICAL CENTER Roosevelt
ASHLEY REGIONAL MEDICAL CENTER Vernal
UTAH VALLEY REGIONAL Provo
JUAB
CENTRAL VALLEY MEDICAL CENTER Nephi
SANPETE
CARBON
CASTLEVIEW Price
SANPETE VALLEY Mt Pleasant
MILLARD
EMERY
GRAND
DELTA COMMUNITY MEDICAL CENTER Delta
GUNNISON VALLEY Gunnison
SEVIER
MOAB REGIONAL Moab
FILLMORE COMMUNITY MEDICAL CENTER Fillmore
SEVIER VALLEY MEDICAL CENTER Richfield
BEAVER
PIUTE
WAYNE
SAN JUAN
MILFORD MEMORIAL Milford
BEAVER VALLEY Beaver
IRON
GARFIELD
VALLEY VIEW MEDICAL CENTER Cedar City
GARFIELD MEMORIAL Panguitch
SAN JUAN Monticello
WASHINGTON
KANE
BLUE MOUNTAIN Blanding
DIXIE REGIONAL MEDICAL CENTER Saint George
KANE COUNTY Kanab
Office of Primary Care and Rural Health, Utah Department of Health
February 2013

Figure 5.

C. Emergency Medical Services for Children

Emergency medical providers face unique challenges when a child needs medical care for a traumatic injury or acute illness because these types of emergency calls are relatively rare events for EMS providers. In addition to being an uncommon experience, children have medical needs that are often much different than adults, and responders must be able to adapt to the unique needs of children in emergency situations. Normal or healthy vital signs change as children grow and mature; intubation to establish a clear airway for breathing is different from adults; and medication dosage must take body weight into account to avoid dosing errors. Difficulties surrounding communication about what is wrong with the child, or what caused the injury can also make it challenging to understand what care the child needs. In response to the special emergency care needs of children, the mission of the Utah EMS for Children program is to improve emergency care for children to help reduce pediatric mortality and morbidity from severe illness and traumatic injury.

Program Partners. With the highest percentage of children in the U.S. and a large geographic state, Utah's EMS for Children program relies on key partnerships to ensure appropriate care and statewide system development. The most recent estimates from the U.S. Census Bureau from 2012 show that 31.1% of Utah's population is younger than 18 years of age compared with 23.5% nationwide. Given Utah's geographical constraints in rural and frontier communities, children with medical emergencies can spend up to two hours in an ambulance being transported to a hospital. When minutes are critical in an emergency, EMS training and support about essential life support skills and knowledge is invaluable to provide life-sustaining care for an injured or sick child. As a result, the EMS for Children program partners serving throughout the state play vital roles.

Primary Children's Hospital partners with the Utah Department of Health EMS for Children program to provide pediatric medical expertise statewide. When children suffer traumatic injuries or acute illness the likelihood of survival and healthy recovery is increased at Primary Children's Hospital which is a Level 1 pediatric trauma center. Doctors and nurses, in partnership with the EMS for Children program, lend their expertise to communities and towns throughout the state.

EMS for Children partners with county coordinators who provide pediatric medical guidance to improve prehospital care for children in their local communities. County coordinators conduct regular training and educational events for EMS agencies in their communities. They serve as liaisons between the EMS for Children program and local EMS agencies and hospitals. The EMS for Children program recruits these volunteer coordinators throughout the state to ensure that every community has a local pediatric expert. There are 44 county coordinators and their contact information is available on the BEMSP website. Figure 6 shows a map of the counties in Utah that have pediatric coordinators.

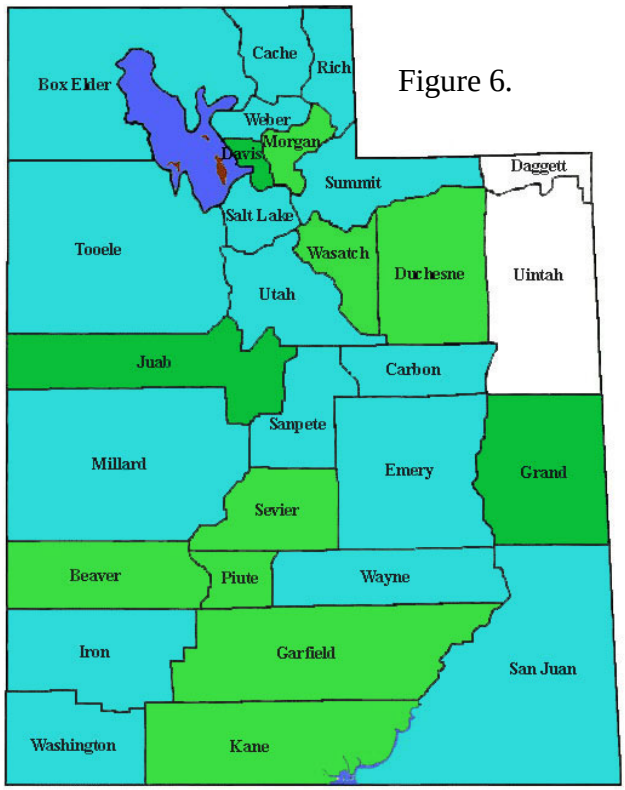


Figure 6.

http://health.utah.gov/ems/emsc/responders.html

County Coordinators in 2014

1 Coordinator

2 Coordinators

Funding partners for the EMS for Children program include the Health Resources and Service Administration which provides grant money that pays for much of the training and education throughout Utah's communities.

The Assistant Secretary for Preparedness and Response provides a federal grant that pays for Utah's EMS for Children Strike Team Coordinator of emergency preparedness for children.

The state of Utah also provides staff support to the EMS for Children program in order for grant money to be used for training, education, and injury prevention. Primary Children's Hospital provides staff support so the program can have clinical expertise on the team.

Training and Education. To provide essential EMS care for children in Utah, the statewide system focuses on regular training, and developing a competent network of EMS agencies and providers that understand and deliver appropriate emergency care for children. From the 911 call to emergency dispatch, to the ambulance and paramedics arriving at the scene, to the emergency department receiving the child, coordination and competence across the system helps ensure the child's unique needs are met. This could mean transporting the child to the appropriate facility and pediatric provider, or bringing that expertise to the child through telemedicine. Utah's EMS for Children program works to provide competent emergency medical care for the ill or injured child that is integrated into the state's emergency medical service system regardless of where a child lives, attends school, or travels in the state.

In 2011, EMS prehospital providers in Utah responded to 19,822 emergency calls for children. While EMTs and hospital staff in Salt Lake City may see children in emergency situations weekly, it's less common for those in rural and frontier communities. Without regular practice, training becomes an essential component of maintaining practical knowledge and skills for emergency situations. The EMS for Children program publishes a monthly newsletter where pediatric physicians and nurses disseminate information and guidance about pediatric medical care. The newsletter focuses on a different pediatric medical condition each month and provides a refresher to practicing clinicians, paramedics, and EMTs. Some agencies use the educational newsletter to help train staff. The newsletter is emailed to hospital and prehospital providers throughout the state.

In an effort to better meet the unique emergency medical needs of children the EMS for Children program helped institute a Utah state requirement that prehospital providers (e.g., EMTs and paramedics) attend pediatric training every four years to maintain sufficient knowledge and skill to provide appropriate emergency care for children in Utah. Two training courses provide certification in Pediatric Education for Prehospital Professions (PEPP), and Pediatric Advanced Life Support (PALS). In 2012, the EMS for Children program certified or renewed medical certifications for 447 PEPP and 49 PALS across state.

D. Professional Development

The BEMSP coordinates training, testing, and certification of more than 5,000 EMTs and 1,700 paramedics to practice prehospital medical care in Utah. In 2009, the National Highway Traffic Safety Administration developed new guidelines for EMS practice and education standards in the United States. Four levels of EMS provider certification are recommended for adoption by all states and territories. Utah is adopting these recommendations and making the gradual transition to the new certification model to ensure all Utah communities, urban and rural, receive uninterrupted emergency medical services throughout the transition.

The following EMS certifications are recognized in Utah in 2014:

Emergency Medical Responder (EMR)—An EMR performs basic lifesaving and first aid. An EMR is not employed by an EMS agency, but is trained in communicating with EMTs and paramedics.

Emergency Medical Technician (EMT)—The primary focus of the EMT is to provide basic emergency medical care and transportation for critical and emergent patients, and to provide care to minimize secondary injury and comfort the patient while transporting the patient to an emergency care facility. This practice level uses a competency-based education course, but courses must include at least 120 hours of training.

Emergency Medical Technician Basic (EMT-B)—EMT-B was the entry level EMS certification in Utah prior to 2012. Between 2012 and 2016, it is being replaced by EMT. An EMT-B handles emergencies utilizing basic life support equipment and skills in accordance with all behavioral objectives in the Department of Transportation, National Standard Curricula, Emergency Medical Technician Basic 1994. It is equivalent to EMT.

Advanced Emergency Medical Technician (AEMT)—The primary focus of the AEMT is to provide basic and limited advanced emergency medical care and transportation for critical and emergent patients who access the emergency medical system. AEMTs perform interventions with the basic and advanced equipment typically found on an ambulance. This level replaces EMT-Intermediate. This is a competency-based course.

Emergency Medical Technician Intermediate (EMT-I)—Between 2011 and 2014, EMT-I is being replaced by AEMT. An EMT-I handles emergencies utilizing basic and advanced life support equipment and skills in accordance with all behavioral objectives in the Department of Transportation, National Standard Curricula (NSC), Emergency Medical Technician Basic 1994 and EMT-I 1998 NSC Utah subset.

Emergency Medical Technician Intermediate Advanced (EMT-IA)—An EMT-IA handles emergencies utilizing basic and advanced life support equipment and skills in accordance with all behavioral objectives in the Department of Transportation and NSC, Emergency Medical Technician Basic 1994 and EMT-I 1998 NSC. An EMT-IA can perform all EMT-B skills and equipment usage, plus key advanced-care skills including additional patient assessment skills, advanced airway adjuncts, intravenous therapy, defibrillation, use of medications, and interpretation of basic cardiac

dysrythmias. The EMT-IA course requires completion of a clinical tracking form and demonstration of competency in all psychomotor objectives; the course typically takes 400–600 hours of training to complete. Utah has only a handful of EMS agencies that operate at the EMT-IA level, but an EMT-IA may work for a lower level agency.

Paramedic—Paramedic is the highest level EMS certification in Utah. A paramedic handles emergencies utilizing all basic and advanced life support equipment and skills in accordance with all behavioral objectives in the Department of Transportation, National Standard Curricula (NSC).

Emergency Medical Technician Basic 1994 and Paramedic 1998 NSC—A paramedic can perform all EMT-B skills and equipment usage, plus advanced life support using intravenous therapy, medications, defibrillator and advanced airway adjuncts to control the airway in cases of respiratory or cardiac arrest. The paramedic course requires at least 610 hours of training and 596 hours of clinical and field experience.

Emergency Medical Dispatcher (EMD)—An EMD handles 911 emergency calls for medical response. An EMD obtains information from callers, allocates EMS resources, and provides emergency care instructions to callers. An EMD is familiar with basic emergency medical concepts. EMD training involves 24 hours of classroom training or completion of an NAEMD-approved course.

Medical Director—A medical director is a licensed physician, usually with a specialization in emergency care, who provides offline medical direction to one or more EMS agencies. A medical director develops and evaluates protocols, oversees training, and ensures that an EMS agency's medical care is compliant with state regulations.

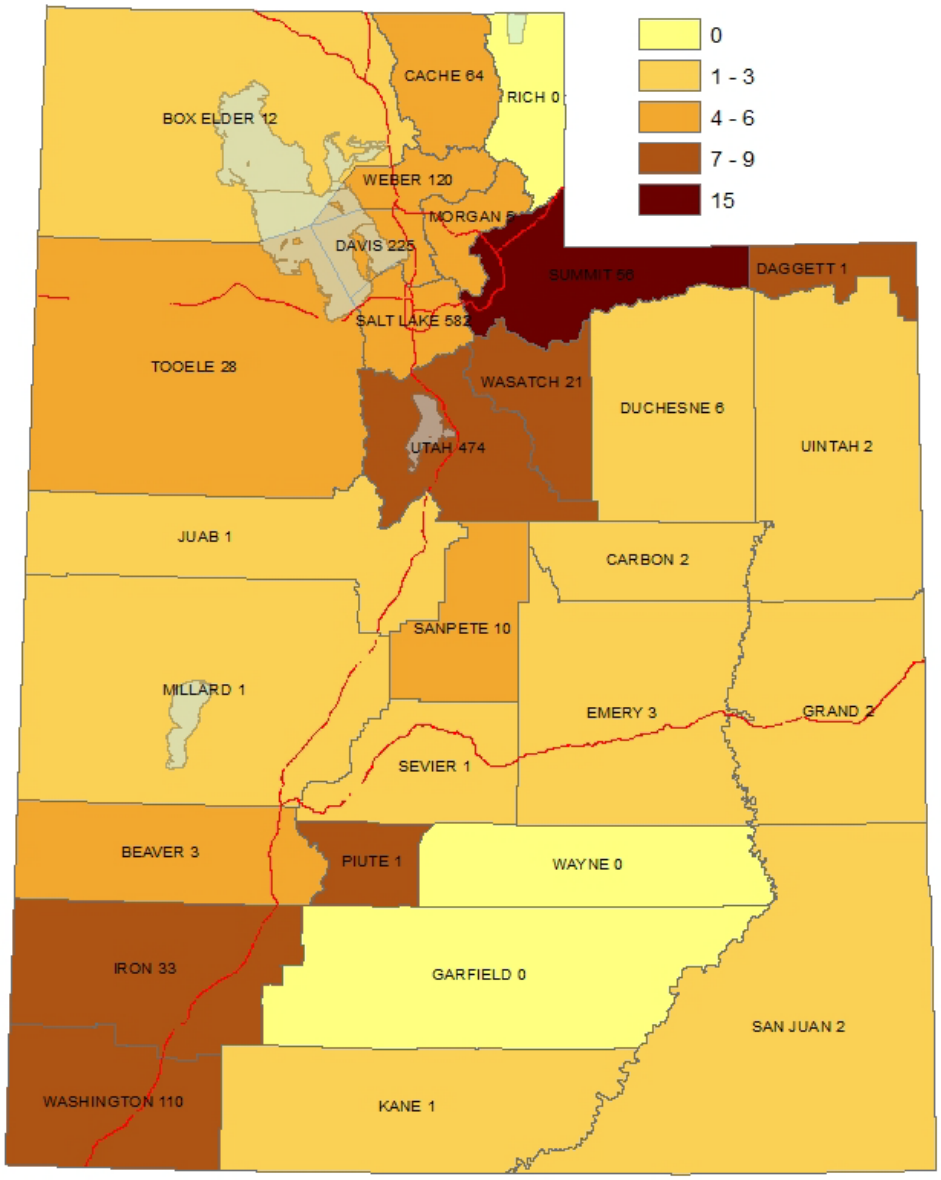
EMS Instructor, Dispatch Instructor, Course Coordinator, and Training Officer—Personnel who provide, coordinate, or oversee training of EMTs, paramedics, and EMDs must be certified. Instructors and course coordinators conduct training courses. Training officers coordinate the ongoing continuing education of the personnel in their EMS agencies.

As of October 1, 2013, BEMSP recognized more than 10,000 prehospital medical care certifications in Utah. The following list shows numbers of certifications.

EMS Certification	Count
Emergency Medical Responder	90
EMT	2581
EMT-Basic	3098
Advanced EMT	2939
EMT-Intermediate	609
EMT-Intermediate Advanced	32
Paramedic	1722
Emergency Medical Dispatcher	717
Medical Director	73
EMS Instructor	719
Course Coordinator	172
Training Officer	305

Figure 7 shows a state map of the population rates of paramedics in each county, and Figure 8 shows the combined rates of paramedics, AEMTs, and EMTs in each county. In general, higher rates of paramedics reside near urban counties, and higher rates of AEMTs and EMTs reside in rural counties.

Number of Paramedics Per 10,000 Population in Each Utah County (May 2014 County Paramedic Rate)

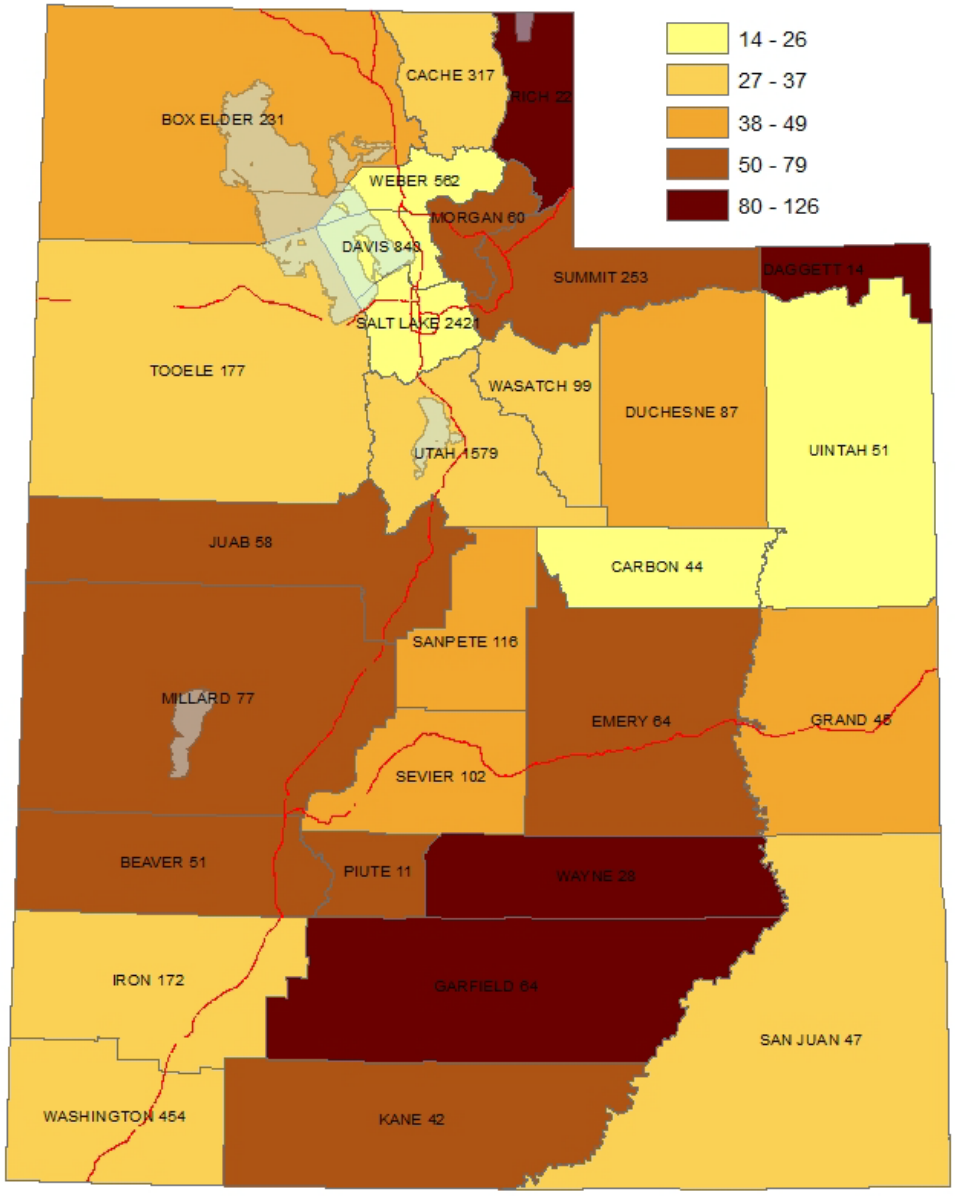


Interpretation: Summit county has the highest rate of Paramedics in Utah, or 15 for every 10,000 persons in the county. The state average is 6 per 10,000 persons.

Note: The number behind each county name is the number of certified Paramedics in the county in May 2014.

Figure 7.

Number of Paramedics, Advanced EMTs, and EMTs Per 10,000 Population in Each Utah County (May 2014 County Rates for all Three Combined)



Interpretation: Uintah county has the lowest rate of Paramedics, Advanced EMTs, and EMTs in Utah, or 14 for every 10,000 persons in the county. The state average is 28 per 10,000 persons.

Note: The number behind each county name is the number of all three EMS Providers in the county in May 2014.

Figure 8.

E. Emergency Medical Services and Trauma Data Systems

Over the past decade Utah's EMS and trauma data systems have advanced in population reporting coverage and database management infrastructure. EMS and trauma data systems in 2014 provide essential information about Utah's EMS and trauma care systems' performance and gaps statewide, as well as in regions, communities and towns. Credible evidence from these data systems provides epidemiological understanding of the existing systems of emergency medical and trauma care to guide justifiable, evidence-based improvements to increase healthy outcomes among Utahns who suffer medical emergencies. Clearly understanding practice patterns and trends in EMS care saves lives when the patterns are fed back into the system to guide and improve EMS policy and practice.

Strong leadership from staff at the University of Utah has helped Utah and the nation to develop useful data reporting and surveillance systems designed to improve health outcomes in Utah and the nation. The National Emergency Medical Services Information System (NEMSIS) supports an EMS database about prehospital medical care in the United States. Utah's Pre-Hospital Online Active Reporting System (POLARIS) uploads selected state EMS indicators into the NEMSIS database to support national reporting. Likewise, the Utah Trauma Registry uploads selected state trauma patient indicators to the National Trauma Data Bank (NTDB) for national reporting about the nation's medical care of traumatic injuries.

POLARIS is Utah's reporting system for all prehospital medical care and response data. This includes information about patient transports and nontransport emergency responses, as well as other prehospital medical care information (e.g., EMS agency characteristics, reporting software, response, dispatch, crew, times, patient characteristics, scene, situation, injury, cardiac arrest, medical history, vital signs, assessments/exams, medications, procedures, destination). Each year about 200,000 patient care reports are reported to POLARIS. Nearly half are reported within 30 hours of the emergency response and about 90% are reported within 35 days. The POLARIS data dictionary is available online: www.nemsis.org/v2/downloads/datasetDictionaries.html.

The Utah State Trauma Registry (www.utahtrauma.org) collects information about hospital visits due to traumatic injuries that meet specific injury-inclusion criteria. The trauma registry provides essential information about time-sensitive trauma medical care (e.g., hospital characteristics, patient characteristics, incident, EMS times, EMS vital signs, ED/hospital times, ED/hospital vital signs, injury

details, diagnoses, procedures, length of stay, outcomes). The number of trauma records submitted to the registry has increased each year since 2001. In 2012, there were more than 11,500 trauma records reported by Utah hospitals. Hospitals upload data to a secure repository monthly. Once each year the data are aggregated and checked for accuracy and cleaned before being uploaded to the registry. The trauma registry data dictionary is available online: https://www.utahtrauma.org/publicResources/utahTraumaDataDictionary.html.

The BEMSP also maintains the certification, licensure, and designation tracking database for EMS agencies and professionals in Utah. This database tracks all agencies and individuals approved to practice prehospital medical care in the state (e.g., contact information, demographics, applications, course/prerequisite completion, expiration dates, written and practical test results, medical director, training officers, employees, vehicles, service area, level and type of service). The system includes about 16,000 certifications, and 260 licenses/designations. Certifications, licenses, and designations require periodic renewal and update.

The BEMSP also acts as the steward for hospital emergency department visits data, including patients released from the emergency department, and those admitted to the hospital (e.g., hospital characteristics, admission, patient characteristics, payment sources, diagnoses, procedures, physicians, charges). Each year about 700,000 emergency department visits are reported in Utah. The emergency department data dictionary is available online: http://health.utah.gov/ems/data/er/.

F. Financial Systems

In 1986, the Utah State Legislature created a funding mechanism to establish an EMS grants program to help offset the lack of tax-based funding and federal aid for the improvement of the EMS system throughout the state. The EMS state program is funded by a dedicated source (criminal fines and forfeitures) which established grants for the improvement of the statewide emergency medical services system. The Department of Health receives an amount equal to 14% of the total amount accumulated through the criminal fines and forfeiture process.

By statute, the EMS Grants Program was divided into fund accounts. The department may use funds for statewide staff support, administrative expenses, other department administrative costs under the EMS Systems Act, and trauma system development. After the costs mentioned, half of the remaining money

is allocated for per capita grants and half for competitive grants to local EMS entities. Although 2014 saw a reduction of $400,000 in fines and forfeitures, EMS grant funding for FY14 was the same as last year, $1.1 million. If the trend of decreasing fines and forfeitures continues, the EMS grants money will necessarily decrease as well.

One-time funding (H.B. 118) of $150,000 was dedicated to the Automated External Defibrillator (AED) Grant. The EMS Grants sub-committee reviewed 46 applications from schools (grades 7-12), state institutions of higher education, and law enforcement agencies. One-third of the grant funds were awarded to schools with the remaining going to law enforcement agencies to purchase AEDs, wall cabinets, AED signs, and carrying cases. As the grant requests totaled over $250,000, it is hoped that funding will be extended an additional year for a program that's proven to save lives.

The Department of Health evaluated the allowable ambulance fee rates and determined that a 3.58% rate increase was necessary for fiscal year 2014. The increase was necessary to offset lower reimbursement rates by insurance companies, increased medical equipment costs, and higher write-offs from uncollectable accounts. Basic life support ground transport charges changed from $594 to $615. Intermediate licensed agencies' charges changed from $785 to $813. Paramedic agencies changed from $1,148 to $1,189. Mileage, off road, and wait time rates all remained the same.

PUBLIC HEALTH AND HEALTHCARE EMERGENCY PREPAREDNESS PROGRAMS

While earthquakes and wildfires are expected in Utah, they still have the potential to result in large natural disasters affecting the health and well-being of thousands of Utahns in a very short period of time. New and emerging infectious diseases can become a pandemic in Utah's population in a matter of hours and days. Additionally, individuals might use biological, chemical, or radiological agents that immediately impact the health of many Utah residents. In response to all health-related hazards and risks, the Utah Department of Health prepares for effective response to immediate and large-scale medical emergencies in the state.

The mission of the Utah Department of Health's Preparedness program is to protect the health of Utahns by enhancing preparedness, response, and recovery capabilities for public health emergencies, in partnership with Utah's local health departments, hospitals, and other agencies. The broad vision is to have a well-prepared and capable public health and medical emergency response system where public health and medical emergencies are handled efficiently and cooperatively by a prepared state and local workforce.

The Utah Department of Health receives funding from the U.S. Department of Health and Human Services in a cooperative agreement administered by two federal agencies, the Centers for Disease Control and Prevention (CDC) and the Office of the Assistant Secretary for Preparedness and Response (ASPR). The CDC funds public health preparedness through UDOH and Utah's local health departments. ASPR funds health care preparedness. The state preparedness program also manages and coordinates grant applications and funding for local agencies partnering in emergency preparedness planning and activities.

An effective system of partnerships and collaborations across thousands of health professionals and dozens of agencies is needed for effective large-scale emergency medical response. Utah's preparedness program acts as a liaison, support, and resource to develop and enhance strong partnerships with various groups including, local health departments, other UDOH preparedness staff (epidemiology, laboratory, public information, IT, immunization, finance, executive director's office and others), other state agencies (Department of Public Safety, Department of Agriculture and Food, Utah National Guard, etc.), and other community partners (hospitals, health clinics, Indian health, volunteer organizations, Utah Hospital Association, and others).

Three program focus areas comprise the current UDOH Preparedness Program projects and teams.

- Emergency Planning and Management
- Health Care Preparedness
- Emergency Response Systems

G. Emergency Planning and Management

The Utah Department of Health (UDOH) has long understood the importance of having emergency plans in place. In the event of a natural disaster, infectious disease pandemic, act of terror, or other emergency situation, it is critical that we are ready to respond in whatever way necessary. Our emergency plans cover various types of emergencies and many functions of response, and ultimately tie into the State Emergency Operations Plan managed by the Utah Department of Public Safety, Division of Homeland Security. In addition, the Centers for Disease Control and Prevention (CDC) provides grant funding and associated requirements for ensuring each state has adequate response plans in place. UDOH emergency plans are guided by, and meet, these requirements. Progress has been made in the last year in updates and revisions to the plans, and additional steps are planned for the coming year.

UDOH Emergency Plans. Of the several emergency plans UDOH maintains, the Emergency Operations Plan (EOP) is the strategic base, providing overarching guidance and continuity between all other plans. The EOP provides information regarding legal authority, the concept of operations (CONOPS), risk assessment, capability assessment, disaster response, and recovery. It also includes disaster protocols, communications processes, UDOH's incident command structure (staffing organization for a response), and necessary forms for requirements and reimbursements.

All other emergency plans stem from the EOP, and are referred to as an annex or appendix. The annexes are operational plans, covering more detail on emergency response for specific hazards or functions. The appendices are tactical documents, with step-by-step detail on a very particular aspect of response, such as standard operating procedures for UDOH's Department Operations Center (DOC). Please see Table 1 for a visual representation of the various emergency plans:

Table 1.

UDOH Emergency Operations Plan (EOP)		
Hazard-Specific Annexes	**Function-Specific Annexes**	**Tactical Appendices**
•Infectious Disease Response Plan •Mass Fatality Plan •Medical Surge/Mass Casualty Plan •Radiological Event Plan	•Continuity of Operations Plan •Operational Communication & Coordination •Public Information & Risk Communication Plan •NDMS Patient Evacuation Plan •Strategic National Stockpile Plan	•Job aides for all response roles •Asset/ resource lists •Department Operations Center standard operating procedures •Building evacuation procedures •Employee Preparedness Guide

These plans are all housed securely, and shared with those in a major leadership or emergency response role. Plans are also shared with our state and federal partners, including the CDC and the Utah Department of Public Safety, Division of Emergency Management.

State Emergency Operations Plan. The UDOH Emergency Operations Plan, along with each of its sub-plans, coincides with the State Emergency Operations Plan (EOP) maintained by the Department of Public Safety, Division of Emergency Management. The state EOP is organized according to emergency support functions, or ESFs, similar to the National Response Framework developed by the Federal Emergency Management Agency (FEMA). In this plan, different state agencies are responsible for the various support functions, all working together for a comprehensive emergency response. The emergency support function that the Department of Health is primarily responsible for is ESF 8, Public Health and Medical Services. Table 2 lists all of the emergency support functions described in the state EOP. The Department of Health has a supporting role in many of the functions, but a greater role in those functions with an asterisk (*).

Table 2.

Emergency Support Functions (ESFs) Utilized by the State Emergency Management EOP ** indicates a supporting (or primary) role served by UDOH*	
1	Transportation
2	Communications
3	Public Works & Engineering*
4	Firefighting
5	Information & Planning (Emergency Management)

6	Mass Care*
7	Resource Support
8	Health & Medical Services*
9	Urban Search & Rescue*
10	Oil & Hazardous Materials Response*
11	Agriculture, Food, Cultural, Historic& Natural Resources*
12	Energy
13	Law Enforcement& Security
14	Utah Disaster Recovery Plan
15	Public Information
16	Military Support

Part of the Base Emergency Operations Plan for the Utah Department of Health is the ESF 8 annex to the state EOP, which describes how we will coordinate the health and medical needs of the state during a major disaster. During an event of such magnitude, the UDOH would send a member of the State Emergency Response Team (SERT) to participate at the state Emergency Operations Center (EOC) as the ESF 8 liaison. This individual (or team) would then respond to the disaster according to the processes outlined in the emergency plans.

Progress to Date. During the last fiscal year, UDOH emergency planners have made some progress in updating plans. Of particular importance is the Continuity of Operations Plan (COOP). UDOH has had a COOP plan for several years. However, over the last two years, the state Division of Emergency Management has requested that all state agencies not only have a COOP plan, but develop it in a particular software system so that all COOP plans are similar and streamlined. This year, UDOH was successful in re-creating its COOP plans in the designated software and format, and has participated in the Statewide Continuity Working Group led by the Division of Emergency Management (DEM). Plans were made in this system for not only the department, but for each of UDOH's divisions, as requested by the Governor's office. These plans were not only sufficient, but exceeded the expectations of DEM and were used as a model for other state agencies.

Also of major note are revisions to UDOH's Pandemic Influenza Plan. This plan was originally created in 2007, and was updated after the H1N1 response in 2009. With more recent outbreaks of other infectious diseases, such as Middle East respiratory syndrome coronavirus (MERS-CoV), it was decided that a broader approach was necessary. Revisions began, and are currently underway, to develop an Infectious Disease Emergency Response Plan to replace the Pandemic Influenza Plan. This plan will

include appendices that target specific diseases, such as pandemic flu, but will also include overarching information for tracking, treating, and responding to any infectious disease. The revised draft plan will likely be completed in 2014, and then be submitted to partners and leadership for final review.

In 2014 and 2015, continued progress will be made to ensure existing plans are well-maintained and updated. In addition, some significant effort will be directed at revisions to the UDOH Emergency Operations Base Plan and in creating a Public Health Risk Assessment. Though many portions of the EOP have been updated recently, the base is in need of restructuring and overhaul. Our effort in the next year will be to develop a base EOP that is more completely in line with the state Division of Emergency Management EOP. We are currently looking into different state plan models to see which structure might be the most effective, and how to incorporate all pieces of the plan together in a cohesive manner.

Additionally, as part of a grant requirement for public health preparedness, we will be conducting a Public Health Risk Assessment/Hazard Analysis. Traditionally, emergency management agencies create a hazard analysis for their state or local jurisdiction. They assess the impact that a particular emergency or hazard would have on a community, and determine which threats are most likely and/or most destructive. Historically, assessments have not included much about public health risks and hazards. Over the next year, however, UDOH emergency planners will work with local health departments and state emergency management to develop a statewide risk assessment that will focus on public health concerns. Additions will include the impacts of disasters to public health, health care, and mental health. Annual updates to other plans will also be in progress.

H. Health Care Preparedness

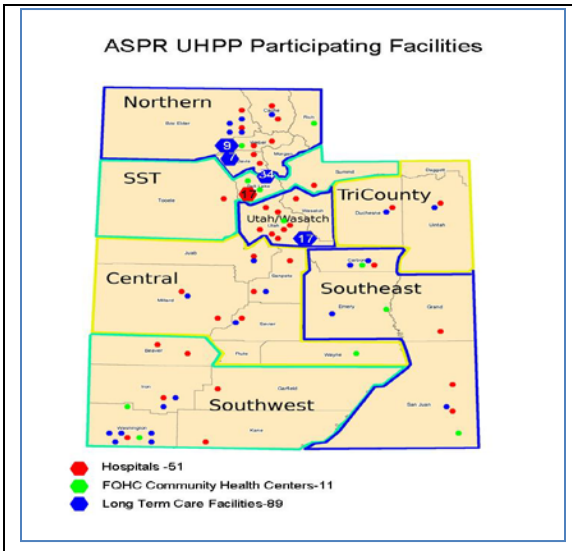
Background and History. The National Bioterrorism Hospital Preparedness Program (NBHPP) was created in 2002 under the U.S. Department of Health and Human Services, Health Resources and Services Administration. It was established soon after the terrorist attacks on September 11, 2001 and the anthrax incidents in our nation. The NBHPP initially provided grants to states to enhance response to bioterrorism attacks. The NBHPP focused on the development of individual facility responses to events that were human-caused, and included funds for training, equipment, and the development of pharmaceutical stockpiles for hospitals and the UDOH. Hospitals in Utah received additional preparedness planning assistance for the 2002 Winter Olympics. Soon after Hurricane Katrina, Congress

passed the Pandemic and All Hazards Preparedness Act (PAHPA) to address identified response deficiencies. The purpose of the PAHPA is to, "improve the Nation's public health and medical preparedness and response capabilities for emergencies, whether deliberate, accidental, or natural." A major outcome of the passage of PAHPA was to create the Assistant Secretary for Preparedness and Response (ASPR) through amendment to the Public Health Service Act, and to move the NBHPP from HRSA to ASPR. As recently as March 2013, the PAHPA was reauthorized by Congress to sustain and improve disaster response across the nation.

HPP Grant Capabilities. All states and a number of major metropolitan areas receive funds through the Healthcare Preparedness Program (HPP). Although the needs, risks, and threats may differ across the country, the HPP provides a planning framework based on eight overarching medical preparedness capabilities. These capabilities are further divided into functions with expected outcomes and outputs for each. The 2012-2017 HPP capabilities include:

1. Healthcare System Preparedness—This capability includes the development of Regional Medical Surge Coalitions (RMSC). In Utah, the HPP has worked with local health departments and other partners to establish seven RMSC across the state, as shown in Figure 9. Primarily hosted by local health departments, RMSC bring together medical, public health, first responder, and emergency management partners in defined geographic areas to engage in joint medical surge planning. RMSC conduct regional risk and threat assessments, develop joint communication plans, conduct training and exercises to improve response capacity, and develop regional caches of equipment that can be deployed to support impacted health care systems.

An important healthcare system preparedness target is identifying at-risk and special medical needs populations, and making preparations with agencies that serve these groups. For example, Utahns who need dialysis treatment will quickly become ill without functioning dialysis centers due to an inability to clear waste products from the blood. In the event of a large-scale disaster these individuals will seek care at local emergency departments adding to the demand on an already overburdened health care system beyond the surge of patients with acute injuries and illnesses from the event. Moreover, many individuals' care and quality of life are currently maintained through residence or regular care in skilled nursing facilities, long-term care facilities, and assisted living facilities. Planning for the needs of these individuals increases the capacity of the residential facilities to ensure continuity of operations.



Regional Medical Surge Coalitions

Northern Utah Healthcare Coalition– Hosted by Bear River Health Department

Salt Lake, Summit, and Tooele Healthcare Preparedness Coalition – Hosted by Salt Lake County Health Department

Uintah Basin Region Healthcare Preparedness Coalition – Hosted by Utah Department of Health

Healthcare Preparedness Coalition of Utah/Wasatch Counties – Hosted by Utah County Health Department

Central Region Healthcare Coalition – Hosted by Central Utah Public Health Department

Southeastern Utah Healthcare Preparedness Coalition – Hosted by Southeastern Utah District Health Department

Southwest Utah Healthcare Preparedness Coalition – Hosted by Southwest Utah Public Health Department

Figure 9. A map and listing of Utah's seven RMSCs.

2. Medical Surge—Medical surge capacity is the ability to provide patient triage and care during incidents that exceed the limits of the normal medical infrastructure in a community. Medical surge preparations help health care organizations survive a large-scale incident, and maintain operations or rapidly recover them if they degrade. The goal of building medical surge capacity aims to limit the need of any one health care facility to move into a degraded (crisis or austere) standard of care. One strategy is to proactively triage patient needs at the scene and distribute the surge across several facilities in a community. Medical surge capacity refers to the ability of a health care facility to accommodate a marked increase in the number of patients, while medical surge capability refers to the ability to manage an increase in patients who require unusual or specialized medical evacuation and care.

With the advancement of RMSC in Utah, hospitals in a region manage patient surge together rather than as individual institutions. In the event of medical surge, hospitals now have standing transfer agreements with area hospitals, availability of additional beds in long-term care/nursing facilities, and early release protocols for stable patients. These coordinated options support hospital decompression allowing hospitals to maintain intake capacity for acute victims of an event. Addressing medical surge from a multiagency view ensures that response to events can be addressed as an integrated system, rather than having a few facilities' resources overwhelmed and others' resources untapped. A recent example of decompression through facility coordination occurred after the Boston Marathon bombings,

when 140 of the 264 injured spectators arrived at area hospitals within minutes of the blast. Instead of one or two facilities becoming over-run with all the injured, the medical surge was dispersed so each Level 1 trauma hospital received between eight and 40 patients.

Lessons learned from Boston and other events have advanced a new paradigm of medical surge management established by the ASPR HPP, and labeled as – Immediate Bed Availability. The concept is based on the ability and need to quickly provide higher-level care to more seriously injured patients during a disaster, particularly when additional resources such as new space, personnel, or equipment are not available. Four constructs underlie the Immediate Bed Availability concept— 1) Continuous monitoring: Available capacity in the existing medical response system must be constantly accessible and known in real-time. How many Red, Yellow, and Green patients can each hospital accept right now? 2) Off-loading: This construct refers to hospital decision-making protocols that take precedence in a large-scale disaster or mass casualty event to increase bed turnover, enact discharge or transfer of low-acuity patients to other facilities, and defer elective admissions/procedures. 3) On-loading: Distributing patient surge based on patient severity across a coordinated system of health care facilities where all resources are known in real-time reduces the likelihood of any one facility becoming overrun and collapsing. 4) Patient Tracking: This refers to the ability of the RMSC to track and monitor the movement of patients throughout the system.

3. Healthcare System Recovery—Planning for the recovery and maintenance of operations of health care systems strengthens medical surge capacity. Recovering medical operations requires the ability to assess damage, establish immediate and long-term needs, and communicate these needs to local and state recovery assistance agencies. Continuity of Operations (COOP) planning includes the ability to assess the continuity of performance of critical health care functions during a wide range of potential emergencies. COOP provides for continued performance of essential hospital functions under all circumstances (i.e., ensure survivability of critical equipment, records and assets; minimize business damage and losses; achieve orderly response and recovery from incident; ensure succession of key leadership).

4. Emergency Operations Coordination—Emergency operations coordination refers to the ability of health care organizations to engage incident management at emergency operations centers and on-scene incident management during an incident to coordinate information and resource allocation for

affected health care organizations. This is done through multiagency coordination representing health care organizations and by integrating this coordination into plans and protocols that guide incident management to make the appropriate decisions.

5. Fatality Management—Fatality management directs organizations in coordinating the proper recovery, handling, identification, transportation, tracking, storage, and return of human remains and personal effects. This includes certifying cause of death and facilitating access to mental/behavioral health services for family members, responders, and survivors of an incident. The state coordinates with health care coalitions, health care organizations, local and state emergency management, ESF #8, and agencies responsible for fatality management to develop plans to assist health care organizations with the treatment of human remains resulting from a surge of deaths during an incident.

6. Information Sharing—Information sharing is the ability to conduct multijurisdictional exchange of public health and medical information and situational awareness updates between the health care system and local, state, federal, tribal, and territorial levels of government and the private sector. This includes sharing health care information through coordination with the Joint Information System (JIS) for dissemination. For example, critical information includes facility infrastructure status, status of evacuation/shelter-in-place operations, critical health care delivery status, staffing status and other information as applicable. Full information sharing ensures a common operating picture for responding agencies and uses information technology systems supported by the HPP. The UDOH has established and uses patient tracking/movement systems, available bed tracking systems, health alert networks, and provider credentialing systems. The UDOH enhances system redundancy by supporting public safety (800 Mhz) and private radio systems for health care facilities and satellite phones assigned to UDOH buildings and health care partners.

7. Responder Safety and Health—This capability describes the ability of health care organizations to protect the safety and health of health care workers from a variety of hazards during emergencies and disasters. This includes processes to equip, train, and provide resources to ensure at-risk health care workers are adequately protected from adverse exposure, illness, and injury during response and recovery operations.

8. Volunteer Management—Volunteer management is the ability to coordinate the identification, recruitment, registration, credential verification, training, engagement, and retention of volunteers to support health care organizations with the medical preparedness and response to incidents and events.

HPP Grant Partnerships. One measure of the success of grant money is the degree to which the funds are distributed and leveraged to improve emergency response capability in Utah's communities. To meet this goal, the HPP allocates funds to a variety of health care facilities, local health departments, health associations, and other partners. This distribution helps ensure that each partner develops response capacity based on localized need, while still contributing to the overall progress as a state.

Hospitals—Hospitals represent the core group of original grant-funded entities under Utah's HPP grant. Funds to hospitals support critical infrastructure needs, caching of equipment and supplies for emergency response, and conducting staff training and exercises. Funds also support hospital collaboration with local community emergency response partners.

Utah Hospital Association—The UHA state-level association grant partnership helps revise state code defining hospital rules for emergency management; helps coordinate the Utah Disaster Assistance Committee (UDAC) statewide hospital planning workgroup; and represents Utah's hospitals at state and national events. The UHA has guided hospitals throughout the state to develop disaster protocols including pandemic triage, treatment, and allocation protocols, multiple burn victim treatment protocols, and development of the overall state strategy for addressing Crisis Standards of Care (CSC). CSC events result from excessive demands placed on the health care system when there may not be enough staff, supplies, or beds to meet patient surge. In these circumstances, prepared hospitals have protocols in place to address the degradation of care that may reach individual patients.

Long-Term Care/Skilled Nursing Facilities (LTC/SNF)—Through grant support and a partnership with the Utah Healthcare Association (UHCA), LTC/SNF and other residential care facilities have opportunities to address emergency preparedness needs related to sustaining operations, communications, and coordination with other health care organizations in their communities through regional medical surge coalitions.

Community Health Centers/Federally-Qualified Health Centers—Through a grant and partnership with the Association for Utah Community Health (AUCH), CHCs receive funding and guidance to include outpatient providers in regional medical surge coalitions; to develop redundant power generation and communication systems; and to provide training and education to CHC staff.

Local Health Departments—Local health departments (LHD) serve as partners in the progression of the HPP hosting meetings for regional medical surge coalitions. LHDs receive funds to support Medical Reserve Corps Units, and each LHD receives CDC Public Health Emergency Preparedness (PHEP) funds to support emergency response coordinator staffing and local progress on public health response activities.

Intermountain Center for Disaster Preparedness—Hosted in LDS Hospital, the Intermountain Center for Disaster Preparedness (ICDP) is partially funded through the HPP to conduct training, education, and exercise events available to health care workers across the state and western U.S. intermountain region. The ICDP serves as a community resource to elevate the skills and opportunities for coordinated response among first responders and health care workers. The ICDP has three defined functions:
1) Provide disaster training and coordination of response algorithms for health and medical workers.
2) Serve as a local casualty collection point in the event of a disaster. The ICDP contains 22 training beds that are ready for conversion to serve patients if needed. 3) Provide additional surge capacity to LDS Hospital if additional beds are needed, and demand in the operable part of the hospital exceeds the supply.

Utah Department of Human Services Division of Substance Abuse and Mental Health—A long lasting partnership between UDOH and DHS supports mental and behavioral health needs of disaster victims, caregivers, and health care workers. The interagency partnership provides funds for inclusion of local community mental health centers into RMSCs, and supports redundant communications equipment, and training of a cadre of crisis counselors ready to respond to events.

I. Emergency Response Systems

Effective communication and rapid mobilization of emergency resources can save lives when a disaster strikes. To meet the needs of timely communication and resource mobilization, Utah has developed emergency tracking systems that quickly and efficiently coordinate and manage the distribution of medical supplies, first responders, hospitals, medical providers, beds, and decision-makers.

Strategic National Stockpile. CDC's Strategic National Stockpile (SNS) stores large quantities of medicine and medical supplies to protect the American public if local supplies are insufficient in a large-scale public health emergency (e.g., terrorist attack, disease outbreak, earthquake). Once federal and state authorities agree that the SNS is needed, medicines will be delivered to Utah to meet the emergency needs. Utah has a plan to distribute SNS medicine and medical supplies to the state's 12 local health departments in a timely manner. The material is brought into a state facility known as a Receiving Stage and Store facility. It is then broken down and divided into quantities for distribution to local health departments. In partnership with the Utah Highway Patrol, the Utah Department of Transportation, and a local transport company, the material is delivered to a local regional distribution site. From there the local health department delivers the material to local Points of Dispensing (POD) where the general public can receive proper emergency medical countermeasures.

- Population covered: 2.8 million
- Number of jurisdictions with mass prophylaxis plans: 12
- Number of Receiving Stage and Store facilities: 2
- Number of Regional/Local Distribution Sites: 12
- Number of Points of Dispensing Sites: 70

Utah Responds. The Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) is a federal program to support states and territories in establishing standardized volunteer registration programs for disasters and public health and medical emergencies. The program, administered by the Utah Department of Health, verifies health professionals' identification and credentials so they can respond more quickly when disaster strikes. By registering through ESAR-VHP, volunteers' identities, licenses, credentials, accreditations, and hospital privileges are all verified in advance, saving valuable time in emergency situations. The web-based system is available to send alerts via phone, e-mail, text, and fax 24 hours a day.

- Partner Agencies: All 12 local health departments, Community Emergency Response Teams, Utah Disaster Medical Assistance Team , state strike teams, state Pediatric Disaster Medical Response Team, state Critical Incident Stress Management Team, Utah Task Force 1, and Utah Emergency Animal Response Coalition
- Number of Registered Users: 3,042
- Number of alerts sent between July 1, 2012–Jun 30, 2013: 110

- Between July 1, 2012–June 30, 2013, alerts were sent to 7,707 recipients

Utah Notification and Information System. CDC's Health Alert Network (HAN) is CDC's primary method of sharing cleared information about urgent public health incidents with public information officers; federal, state, territorial, and local public health practitioners; clinicians; and public health laboratories. The Utah Notification and Information System links between the CDC and Utah's local health departments. The system is available to send alerts via phone, e-mail, text, and fax 24 hours a day.

- Partners include: Local health departments, hospitals, health care coalitions, Utah National Guard and others
- Number of Registered Users: 5157
- Number of alerts sent between July 1 2012–June 30 2013: 349 or 29.08 per month
- Between July 1 2012–June 30 2013, alerts were sent to 9,625 recipients

Utah Healthcare Resource Management System. The Utah Healthcare Resource Management System (UHRMS) is designed to be a real-time, electronic hospital bed tracking/monitoring system. In the event of large-scale emergency or disaster, UHRMS will serve as an emergency management tool to assist with response operations to support health care facilities in event of patient surge. HAvBED is a federal program under the U.S. Department of Health and Human Services, Assistant Secretary for Preparedness and Response and is supported by the Utah Hospital Preparedness Program. The goal of HAvBED is to maintain a national real-time hospital bed tracking system to address a surge of patients during a mass casualty event.

- All hospitals in the State of Utah are active participants in the UHRMS system
- Bed types reported include: Adult ICU, Adult Med-Surgical, Airborne Infection Isolation, Burn Care, OR, Pediatric ICU, Pediatric Med-Surgical, Psychiatric
- UHRMS utilizes an integration with the national HAvBED system to share data
- The average reporting percentage for Utah hospitals during monthly drills July 1, 2012 to June 30, 2013: 91.8%