



August 2022

PUBLIC HEALTH PREPAREDNESS COVID-19 Medical Surge Experiences and Related HHS Efforts

Accessible Version

GAO Highlight

Highlights of [GAO-22-105461](#), a report to congressional addressees

Why GAO Did This Study

HHS leads the nation's medical and public health preparedness for, response to, and recovery from emergencies and disasters. This includes helping hospitals and others build medical surge readiness. Emergencies, such as the COVID-19 pandemic, put enormous strain on hospitals in times of crisis.

The Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019 includes a provision for GAO to review implementation of HHS's regional preparedness and response guidelines for hospitals and other facilities to increase medical surge capacity. Issuance of these guidelines has been delayed due to the continuing COVID-19 response, according to HHS. The CARES Act also includes a provision for GAO to report on the federal response to the pandemic. This report describes (1) medical surge challenges selected hospitals faced in responding to the COVID-19 pandemic and how health care coalitions have supported their efforts, and (2) selected HHS programs and activities underway to support medical surge readiness.

To do this work, GAO reviewed HHS and hospital documentation. GAO also interviewed HHS officials and representatives from a non-generalizable sample of eight hospitals and eight associated coalitions across three states. These states were selected based on their involvement in HHS regional preparedness and response efforts.

We provided a draft of this report to HHS for review and comment. HHS provided technical comments, which we incorporated as appropriate.

View [GAO-22-105461](#). For more information, contact Mary Denigan-Macauley at (202) 512-8552 or DeniganMacauleyM@gao.gov.

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PUBLIC HEALTH PREPAREDNESS

COVID-19 Medical Surge Experiences and Related HHS Efforts

What GAO Found

The COVID-19 pandemic has highlighted the importance of hospitals' abilities to evaluate and care for an increased volume of patients exceeding normal operating capacity, known as medical surge. All eight hospitals in GAO's review reported multiple challenges related to staff, supplies, space, or information. These are critical components for an effective medical surge response, according to the Department of Health and Human Services (HHS). All eight hospitals reported staffing challenges, such as a lack of staff to care for the increase in sick patients or staff becoming ill and unable to work, affecting hospital services. Hospitals took steps to address these challenges, such as supplementing staffing levels where possible or training staff on proper personal protective equipment use to prevent infection. Health care coalitions—groups of health care and response organizations in a defined geographic location supported by HHS funding—aided hospitals. For example, they helped coordinate patient transfers to balance hospital loads, obtain and distribute needed medical supplies, and communicate hospital needs to their states.

Health Care Workers Responding to the COVID-19 Pandemic



Source: Federal Emergency Management Agency (left) and Centers for Disease Control and Prevention (right). | [GAO-22-105461](#)

HHS has programs and activities underway intended to support medical surge readiness for hospitals and other health care organizations, but it is too soon to know the effectiveness of these efforts. For example, HHS implemented a new medical surge exercise for coalitions in 2021 to test readiness, and plans to establish targets to measure performance. It is also considering how to use the findings and lessons learned from its 2021 assessment of coalitions during the pandemic to improve its support of coalitions and their communities. HHS is also funding the development of a regional disaster health response system, which aims to develop effective approaches to medical surge response across multiple states. This includes improving data sharing on resource and capacity issues, and developing specialized teams that can respond to a range of hazards. HHS is considering its next steps regarding the expansion of this regional system. Further, HHS is developing regional guidelines for hospitals and other facilities related to treating patients and increasing medical surge capacity during public health emergencies as required by statute. Officials did not provide a date for when the guidelines would be made publicly available.

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Abbreviations

PAHPAI Act	Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019
ASPR	Office of the Assistant Secretary for Preparedness and Response
HHS	Department of Health and Human Services
HPP	Hospital Preparedness Program
PPE	personal protective equipment

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August 17, 2022

Congressional Addressees

Emergencies and disasters have highlighted the critical role that health care organizations, such as hospitals and emergency medical services, play in treating medical needs in the wake of mass casualty events. Events such as the ongoing COVID-19 pandemic, extreme weather, and acts of terrorism have required hospitals to rapidly and significantly expand capacity and resources to provide medical care. This ability to evaluate and care for a markedly increased volume of patients that exceeds normal operating capacity is known as medical surge, according to the Office of the Assistant Secretary for Preparedness and Response (ASPR), within the Department of Health and Human Services (HHS).¹

ASPR leads the nation’s medical and public health preparedness for, response to, and recovery from emergencies and disasters. According to ASPR, an effective medical surge response requires health care delivery systems to build key planning and resource capabilities.² ASPR supports the advancement of these capabilities through the Hospital Preparedness Program (HPP) cooperative agreement, among other efforts.³ This program is the primary source of federal funding for health care system preparedness for emergencies and disasters, which includes increasing medical surge capacity. HPP funds and promotes the development of

¹Office of the Assistant Secretary for Preparedness and Response, *2017-2022 Health Care Preparedness and Response Capabilities* (Washington, D.C.: November 2016).

In July 2022, the Secretary of Health and Human Services removed ASPR from the HHS Office of the Secretary and created a new operating division in the department, to be known as the Administration for Strategic Preparedness and Response. In this report, we refer to ASPR under the organizational name and structure in place at the time we conducted our review.

²ASPR, *2017-2022 Health Care Preparedness and Response Capabilities*.

³A cooperative agreement is a federal award to a non-federal entity to carry out a public purpose. Unlike grants, cooperative agreements generally provide for substantial involvement between the federal awarding agency and the non-federal entity in carrying out the activity contemplated by the award. For the purposes of this report, we will refer to the HPP cooperative agreement as HPP. HPP provides funds to the public health departments of 62 states and other jurisdictions through cooperative agreements, according to ASPR.

health care coalitions (coalitions)—groups of health care and response organizations in a defined geographic location that coordinate emergency preparedness and response activities across their members. Key coalition activities include sharing real-time information, coordinating the distribution and sharing of medical supplies, and coordinating joint planning exercises, according to a document on ASPR’s website.

Since 2020, through our CARES Act work, we have reported on a number of challenges faced by the nation, including hospitals, in responding to the COVID-19 pandemic. For example, in March 2021, we reported that hospitals expressed concerns about the availability of COVID-19 vaccines and testing supplies, as well as other medical supplies, such as personal protective equipment (PPE).⁴ In January 2022, we added HHS’s leadership and coordination of public health emergencies to our high-risk list, in part due to persistent deficiencies in the department’s ability to execute its role leading federal public health and medical preparedness for, and response to, public health emergencies.⁵

The Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019 (PAHPAI Act) required ASPR to publish regional guidelines on practices and protocols for hospitals and other health care facilities to provide appropriate patient care during, in advance of, or immediately following a public health emergency.⁶ The purpose of these guidelines is to assist facilities in their ability to treat patients and increase medical surge capacity in the event of a public health emergency. The PAHPAI Act includes a provision for GAO to review the extent to which hospitals and health care facilities have implemented these guidelines.⁷ However, according to ASPR, issuance of the regional guidelines has been delayed largely due to ASPR’s continuing response to the COVID-19 pandemic.

⁴GAO, *COVID-19: Sustained Federal Action Is Crucial as Pandemic Enters Its Second Year*, GAO-21-387 (Washington, D.C.: Mar. 31, 2022).

⁵GAO, *COVID-19: Significant Improvements Are Needed for Overseeing Relief Funds and Leading Responses to Public Health Emergencies*, GAO-22-105291 (Washington, D.C.: Jan. 27 2022).

⁶Pub. L. No. 116-22, § 203(a), 133 Stat. 905, 911-13 (codified at 42 U.S.C. § 247d-3c).

⁷Pub. L. No. 116-22, § 203(b), 133 Stat. at 913-14.

The CARES Act also includes a provision for us to report on the federal response to the COVID-19 pandemic.⁸ In this report we describe

1. the medical surge challenges selected hospitals faced in responding to the COVID-19 pandemic and how coalitions supported their efforts, and
2. selected ASPR programs and activities that support medical surge readiness.

To address both objectives, we reviewed documents from and interviewed officials from a non-generalizable sample of eight hospitals and their associated eight coalitions in three selected states (Colorado, Massachusetts, Nebraska).⁹ We also interviewed officials from the state public health departments in two of the three selected states.¹⁰ The documents we reviewed included academic articles about hospitals' COVID-19 experiences and presentations hospital officials developed to describe their COVID-19 responses. We also reviewed an ASPR report assessing the engagement of coalitions in the COVID-19 response.¹¹

Although the experiences of selected hospitals, coalitions, and state officials are not generalizable across all states, coalitions, or hospitals, their selection was intended to illustrate a variety of experiences. We

⁸Specifically, the CARES Act directs us to monitor and oversee the federal government's efforts to prepare for, respond to, and recover from the pandemic. Pub. L. No. 116-136, § 19010, 134 Stat. 281, 579-81 (2020). In addition to our reports on individual programs, we have regularly issued government-wide reports on the federal response to the COVID-19 pandemic. For the latest report, see GAO, *COVID-19: Current and Future Federal Preparedness Requires Fixes to Improve Health Data and Address Improper Payments*, GAO-22-105397 (Washington, D.C.: Apr. 27, 2022). All of these reports are available on GAO's website at <https://www.gao.gov/coronavirus>.

⁹We originally selected nine hospitals and nine coalitions, but ultimately only eight hospitals and eight coalitions were available to participate in an interview.

In Massachusetts, the state public health department operates the state's single coalition, and it is composed of entities, known as health and medical coordinating coalitions, which represent smaller regions within the state. For the purposes of our study, we considered these health and medical coordinating coalitions to be coalitions.

¹⁰The public health department for the state of Nebraska did not ultimately respond to our request for an interview.

¹¹Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response Technical Resources, Assistance Center, and Information Exchange, *Healthcare Coalition Engagement in COVID-19 Assessment* (Washington, D.C.: December 2021).

selected those three states because each contains one of ASPR's demonstration sites for the Regional Disaster Health Response System; according to ASPR officials, the sites' experiences helped inform the development of the regional guidelines required under the PAHPAI Act.¹² For our sample, we included three hospitals from the selected demonstration sites, as well as five other hospitals.¹³ To identify the remaining five hospitals:

- We first used 2019 U.S. Census population data to identify the geographic coverage areas of coalitions in each state that corresponded with the most populous and least populous parts of each state (after excluding coalitions associated with lead demonstration site hospitals).¹⁴
- Within each selected coalition, we used the 2020 Centers for Medicare & Medicaid Services' Provider of Services data file, a

¹²According to ASPR, the goal of the Regional Disaster Health Response System demonstration project is to test new approaches, establish regional partnerships to improve disaster readiness capabilities and capacity, increase medical surge capacity, enhance situational awareness, and extend the provision of specialty care. As of June 2022, ASPR has funded four Regional Disaster Health Response System hospital demonstration sites, each located in one of 10 HHS regional offices across the nation, which are composed of multiple states or territories.

¹³Specifically, we included in our sample three hospital demonstration sites at Massachusetts General Hospital (Boston, MA), Nebraska Medicine (Omaha, NE), and Denver Health and Hospital Authority (Denver, CO). We excluded from our review the fourth demonstration site (Emory University Hospital; Atlanta, GA) as it had only recently started its activities at the time of our review.

¹⁴For Massachusetts, we selected the hospital located in the least populated place associated with the coalition coverage area.

publicly available data source that contains information on hospitals, to randomly select one hospital.¹⁵

For the purposes of this report, we refer to the three hospitals from coalitions that cover the least populous area of their state as rural hospitals. For our hospital interviews, we interviewed officials such as staff in leadership positions, including chief executive, operating or medical officers, and staff responsible for hospital emergency preparedness activities. For our coalition interviews, we interviewed staff such as coalition coordinators and clinical advisors. For our state public health department interviews, we interviewed officials such as staff responsible for managing HPP in their state or officials from state emergency management agencies.

To provide additional information on medical surge challenges faced by hospitals during the COVID-19 pandemic and how coalitions supported their efforts, we also interviewed three individuals with subject matter expertise on medical surge readiness issues who presented at recent ASPR or National Academies of Sciences, Engineering, and Medicine webinars on health care preparedness and response. Additionally, we interviewed representatives from two national organizations that represent the majority of hospitals (the American Hospital Association and America's Essential Hospitals).¹⁶ The American Hospital Association represents all types of hospitals, including those in rural areas, and

¹⁵To capture the experiences of more traditional, short-term acute care hospitals, we excluded critical access hospitals because they are special types of hospitals with different conditions of Medicare participation, such as increased flexibilities in hospital staffing requirements, and increased Medicare payment rates when compared to other hospitals. According to the Centers for Medicare & Medicaid Services, to be designated a critical access hospital, the hospital must meet certain criteria, such as: being located in a rural area; being located either more than 35 miles from the nearest hospital or critical access hospital or more than 15 miles in areas with mountainous terrain or only secondary roads; and, maintain no more than 25 inpatient beds that can be used for either inpatient or swing-bed services. In addition, according to ASPR, critical access hospitals have a more limited range of services available when compared to other hospitals. According to 2020 Centers for Medicare & Medicaid Services data, 71 percent of hospitals certified to participate in Medicare and/or Medicaid are short-term acute care hospitals. Within each coalition coverage area, we also excluded any hospitals that are a part of the same health care system associated with a hospital that we already selected. One of the nine coalitions we selected was unable to participate because, according to ASPR, this coalition became inactive during the COVID-19 pandemic. Additionally, one of the nine hospitals we selected was unable to participate. We then contacted two other hospitals within the same coalition, but neither one responded to our interview requests.

¹⁶According to the American Hospital Association, the organization represents approximately 5,000 hospitals out of 6,093 in the United States. According to America's Essential Hospitals, the organization represents more than 325 hospitals.

America's Essential Hospitals represents safety net hospitals in urban areas.

To describe selected ASPR programs and activities underway that support medical surge readiness, we focused our review on ASPR efforts that address all types of hazard events and are relevant to the development of the regional guidelines required under the PAHPAI Act. Specifically, we reviewed HPP, the Regional Disaster Health Response System, and ASPR's efforts to develop regional guidelines. In selecting these efforts, we first identified the programs and activities funded through the portion of ASPR's budget that funds HPP. Those include the Regional Disaster Health Response System, the ASPR Technical Resources, Assistance Center, and Information Exchange, and the National Special Pathogen System, among others. We focused on HPP because it comprises about 78 percent of this budget line item for fiscal year 2022. We also included the Regional Disaster Health Response System because, according to ASPR officials, it is helping inform the office's development of the regional guidelines required under the PAHPAI Act. We obtained and analyzed ASPR documents, such as guidance on preparedness and response capabilities to support medical surge readiness and reports on activities of the Regional Disaster Health Response System, and coalition activities during the COVID-19 pandemic.¹⁷ In addition, we collected and analyzed progress reports from the Regional Disaster Health Response System demonstration sites in our sample. We also reviewed written responses and interviewed officials from ASPR, as well as representatives from the Regional Disaster Health Response System demonstration sites and coalitions in our sample.

We conducted this performance audit from October 2021 to August 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

¹⁷See ASPR, 2017-2022 *Health Care Preparedness and Response Capabilities*; and ASPR Technical Resources, Assistance Center, and Information Exchange, *Healthcare Coalition Assessment*.

Background

HPP Mission and Funding

According to ASPR, HPP enables the nation's health care delivery system to save lives during emergencies and disasters when they exceed the day-to-day capacity of existing health and emergency response systems.¹⁸ HPP develops coalitions to support cooperation among different health care organizations, such as hospitals.¹⁹ HPP provides funds to the public health departments of 62 jurisdictions through cooperative agreements, according to ASPR.²⁰ These recipients, in turn, support the coalitions within their defined geographic areas. HPP supported 321 coalitions, according to ASPR, based on June 2021 data.

Funding for HPP has generally decreased over time, according to ASPR data (see fig.1). For example, funding for HPP decreased from about \$500 million in fiscal year 2003 to about \$230 million in fiscal year 2022. In certain years, supplemental appropriations enacted to address public health emergencies have been used to provide additional funding to HPP recipients. For example, as of June 2020, ASPR had provided about \$159 million in COVID-19 relief funds to HPP recipients to further support the work of coalitions and other health care facilities in their geographic areas, according to ASPR data. In addition, ASPR implemented flexibilities for states and other jurisdictions to request use of Ebola relief funding, on a limited case-by-case basis, for the development of action plans, training, and the rapid procurement of supplies needed during the COVID-19 emergency response.²¹

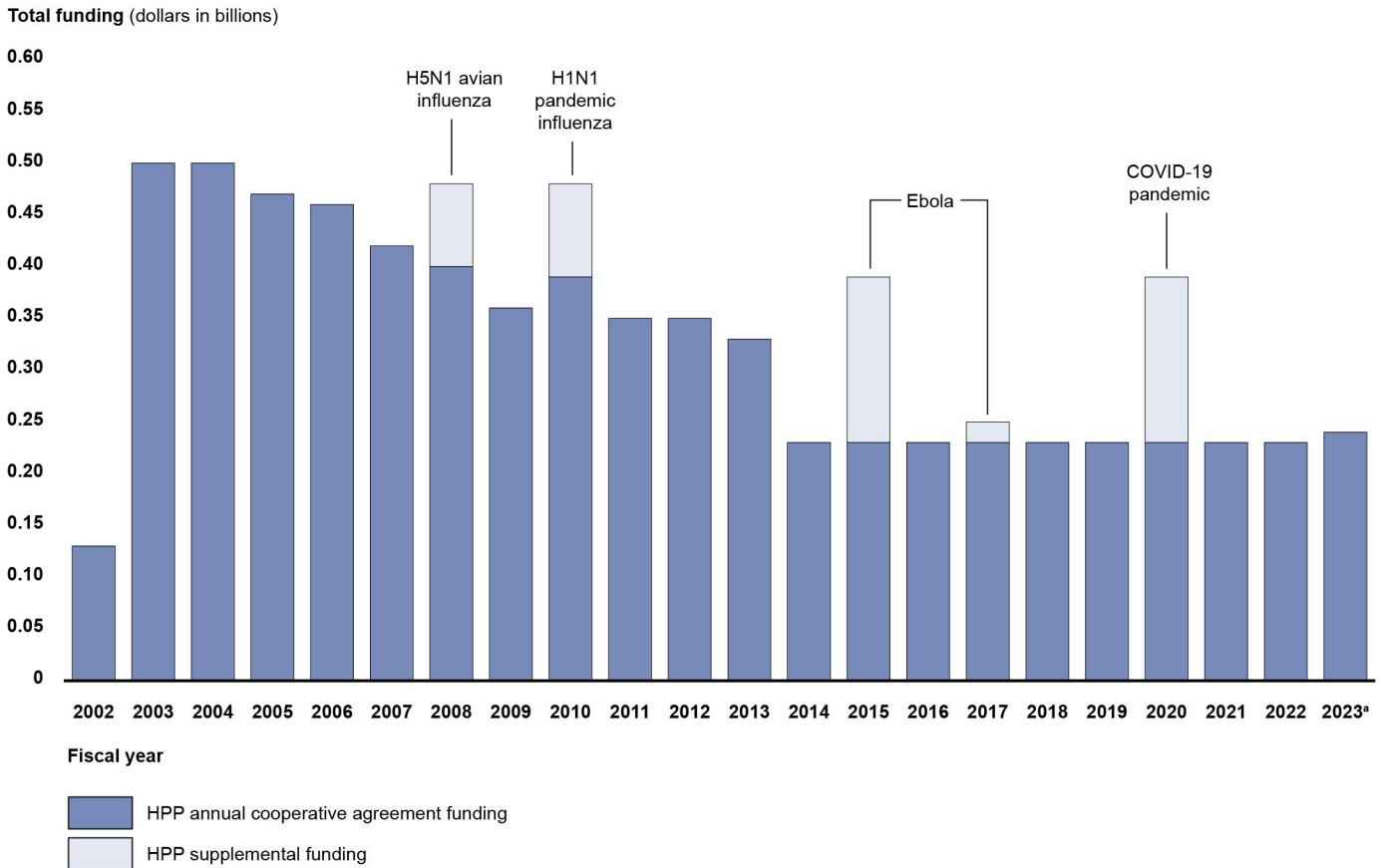
¹⁸ASPR, *2017-2022 Health Care Preparedness and Response Capabilities*. According to ASPR, the health care delivery system includes but is not limited to hospitals, emergency medical services, outpatient health care facilities, skilled nursing and long-term care facilities, support service providers (such as clinical laboratories, pharmacies, and blood banks), emergency management organizations, and local public safety agencies.

¹⁹ASPR, *2017-2022 Health Care Preparedness and Response Capabilities*.

²⁰The 62 jurisdictions consists of the 50 states, 8 territories and freely associated states, and 4 cities.

²¹In addition, according to ASPR officials, in 2020, ASPR allocated other funding to further bolster the COVID-19 health care response, including \$175 million to hospital associations, \$6.5 million for Regional Ebola and other Special Pathogen Treatment Centers, and \$10 million for the National Emerging Special Pathogens Training and Education Center.

Figure 1: Hospital Preparedness Program (HPP) Cooperative Agreement Funding, by Source, Fiscal Years 2002 through 2023



Source: GAO analysis of Office of the Assistant Secretary for Preparedness and Response (ASPR) data. | GAO-22-105461

Accessible Data Table for Figure 1

Fiscal year	HPP annual cooperative agreement funding	HPP supplemental funding	Notes
2002	0.13	0.00	
2003	0.50	0.00	
2004	0.50	0.00	
2005	0.47	0.00	
2006	0.46	0.00	
2007	0.42	0.00	
2008	0.40	0.08	H5N1 avian influenza
2009	0.36	0.00	
2010	0.39	0.09	H1N1 pandemic influenza
2011	0.35	0.00	

Letter

Fiscal year	HPP annual cooperative agreement funding	HPP supplemental funding	Notes
2012	0.35	0.00	
2013	0.33	0.00	
2014	0.23	0.00	
2015	0.23	0.16	Ebola
2016	0.23	0.00	
2017	0.23	0.02	Ebola
2018	0.23	0.00	
2019	0.23	0.00	
2020	0.23	0.16	COVID-19
2021	0.23	0.00	
2022	0.23	0.00	
2023	0.24	0.00	

Notes: Amounts for fiscal years 2002 through 2021 reflect total obligated amounts for the HPP cooperative agreement. The amount shown for fiscal year 2022 reflects the allocated amount for the HPP cooperative agreement; as of June 15, 2022, this amount had not yet been approved for obligation. H5N1 avian influenza supplemental funding was awarded in fiscal year 2008 using supplemental appropriations enacted in fiscal year 2006. H1N1 pandemic influenza supplemental funding was awarded in fiscal year 2010 using supplemental appropriations enacted in fiscal year 2009. Ebola supplemental funding shown reflects funding from the HPP Ebola Preparedness and Response Activities Part A cooperative agreement. In calendar year 2020, ASPR implemented flexibilities for HPP cooperative agreement recipients to request use of Ebola funds, on a limited case-by-case basis, for the development of action plans, training, and the rapid procurement of supplies needed during the COVID-19 emergency response.

^aThe amount shown for fiscal year 2023 reflects appropriations requested in the President's fiscal year 2023 budget.

Coalition Staffing and Membership

According to the fiscal year 2019-2023 HPP funding opportunity announcement, coalitions must employ at least two staff members, a coordinator and a clinical advisor.²² Specifically, the role of the coordinator is to lead or support the activities of the coalition (including by facilitating coalition planning, training, exercising, operational readiness, and ongoing development), while the clinical advisor provides clinical leadership and guidance to support the goals of the coalition. Coalition activities include developing response plans and communication protocols and systems, conducting joint planning exercises, and educating and training health care personnel.

²²These positions must add up to at least one full-time equivalent.

Medical Surge

Medical surge—the ability to evaluate and care for a markedly increased volume of patients that exceeds normal operating capacity—requires building both capacity and capability, according to the Office of the Assistant Secretary for Preparedness and Response, which defines each as follows.

Surge capacity: The ability to manage a sudden influx of patients, and is dependent on the variables of space, supplies, and staff, among other things.

Surge capability: The ability to manage patients requiring specialized medical care. This includes providing services that are not normally available at the location where they are needed (e.g., pediatric care provided at non-pediatric facilities or burn care services at a non-burn center) and in response to uncommon and resource-intensive patient diagnoses to protect medical providers, other patients, and the integrity of the medical care facility.

Source: Office of the Assistant Secretary for Preparedness and Response (information), Halfpoint/stock.adobe.com (photo). | GAO-22-105461

Coalitions are required to include four core members that provide key support to the health care delivery system and play a critical role during emergencies and disasters: hospitals, emergency medical services, emergency management organizations, and public health agencies, according to ASPR.

ASPR’s Health Care Preparedness and Response Capabilities

Although coalitions do not provide direct clinical care, they play a critical role in developing the health care delivery system preparedness and response capabilities needed for an effective medical surge response, according to ASPR.

To describe what the health care delivery system has to do to effectively prepare for and respond to public health emergencies and disasters, ASPR issued its 2017-2022 Health Care Preparedness and Response Capabilities guidance (capabilities guidance), which identifies four key health care preparedness and response capabilities (see table 1).²³

²³ASPR, *2017-2022 Health Care Preparedness and Response Capabilities*. The intended audience for the capabilities guidance is any health care delivery system organization, health care coalition, or state or local agency that supports the provision of care during emergencies, according to ASPR. This guidance is separate from the regional guidelines that ASPR is required to publish under the PAHPAI Act.

Table 1: The Four Key Health Care Preparedness and Response Capabilities, according to the Office of the Assistant Secretary for Preparedness and Response (ASPR)

Capability	Goal(s)
Foundation for health care and medical readiness	The community's health care organizations and other stakeholders have strong relationships, identify hazards and risks, and prioritize and address gaps through planning, training, exercising, and managing resources. Such outcomes are facilitated by a sustainable health care coalition (coalition). ^a
Health care and medical response coordination	With support from the coalition, the community's health care organizations, their jurisdiction(s), and the lead Emergency Support Function-8 agency plan and collaborate to share and analyze information, manage and share resources, and coordinate strategies to deliver medical care to all populations during emergencies and planned events. ^b
Continuity of health care service delivery	With support from the coalition and the lead Emergency Support Function-8 agency, the community's health care organizations provide uninterrupted and optimal medical care to all populations in the face of damaged or disabled health care infrastructure. The community's health care workers are well-trained, well-educated, and well-equipped to care for patients during emergencies. The community's simultaneous response and recovery operations result in a return to normal, or ideally, improved operations.
Medical surge	The community's health care organizations—including hospitals, emergency medical services, and out-of-hospital providers—deliver timely and efficient care to their patients even when the demand for health care services exceeds available supply. In collaboration with the lead Emergency Support Function-8 agency, the coalition coordinates information and available resources for its members to maintain conventional surge response. In cases when an emergency overwhelms the coalition's collective resources, the coalition supports the health care delivery system's transition to contingency and crisis surge response and promotes a timely return to conventional standards of care as soon as possible.

Source: ASPR. | GAO-22-105461

Note: See Office of the Assistant Secretary for Preparedness and Response, 2017-2022 Health Care Preparedness and Response Capabilities (Washington, D.C.: November 2016).

^aHealth care coalitions are groups of individual health care and response organizations in a defined geographic location, such as a state or an area within a state.

^bThe lead Emergency Support Function-8 agency refers to the state or local agency that coordinates with the federal government during emergencies and disasters for needed public health and medical services as a part of the National Response Framework. ASPR is the lead federal entity for Emergency Support Function-8 (public health and medical services).

Although the capabilities inform coalition activities, they are designed for the entire health care delivery system. The capabilities encompass a range of preparedness and response activities that, if conducted, represent the ideal state of readiness in the United States, according to ASPR. Further, these capabilities are intended to build upon each other successively to establish a strong foundation for medical surge readiness.

Hospital Medical Surge Challenges and Coalition Support Responding to the COVID-19 Pandemic

Medical Surge Challenges Selected Hospitals Faced Responding to the COVID-19 Pandemic

Officials we interviewed from all eight hospitals in our review, including from three rural hospitals, described facing a number of medical surge challenges during their COVID-19 responses, such as those related to staffing, supplies, space, and information.²⁴ They also described a range of strategies they implemented to address these challenges as the virus passed through communities of all sizes across the nation at various times in waves, each lasting weeks or months and placing extraordinary pressure on the health care system.

Prior to the pandemic, officials from all eight hospitals reported that they experienced medical surges in the wake of events—such as shootings or severe weather—or participated in emergency planning activities to prepare them to implement an effective medical surge response to an emergency or disaster. Examples of planning activities included exercises or trainings to simulate actions hospitals would take in response to an event or developing plans that described how hospitals would respond to such an event. However, officials from multiple hospitals (six hospitals) noted that prior exercises and events were insufficient to prepare them for the realities of the response needed for the COVID-19 pandemic. For example, based on trainings and exercises, one hospital official said they anticipated that their hospital would be largely self-sufficient in an emergency or disaster, but realized this was not the case when COVID-19 hit their area, and they needed help. Officials from the selected hospitals described the following challenges.

Staffing challenges. Officials we interviewed from all eight hospitals indicated staffing was a challenge during the pandemic. Examples of

²⁴The extent to which the challenges described were ongoing at the time of our interviews, which were generally conducted between January and March 2022, varied by challenge and hospital. For example, some of the challenges hospital officials described occurred early on in the pandemic, or during the wave coinciding with the introduction of the Delta variant.

staff-related challenges included staffing shortages—such as those due to resignations and illness—as well as staff burnout and low morale.

- *Staffing shortages.* Officials from multiple hospitals (five hospitals) described how staffing shortages made it difficult for their hospitals to continue to provide patient care and to respond to the pandemic. An official from one hospital said, at one point during the Delta variant wave, due to a combination of COVID-19 infections in the community and among staff, their hospital did not have enough workers to be able to operate all available beds.²⁵ To address staffing shortages, this official said their hospital requested and received nurses from the federal government to supplement staffing levels.²⁶ Officials from other hospitals reported taking steps to increase their staffing levels, for example, by hiring travel nurses from private staffing agencies, expanding their hiring pool to include nurses with lower level credentials than they would normally hire, or using existing staff in different ways. For example, officials from one hospital reported assigning staff from the radiology department to screen patients and staff for COVID-19 infections. Hospital officials also reported implementing strategies to prevent staff shortages due to illness; for example, one hospital used telemedicine to provide patient care, thereby reducing staff risk of infection while they continued to provide patient care.

²⁵According to the Centers for Disease Control and Prevention, Delta became the dominant variant on June 1, 2021, and resulted in a wave of infections in summer 2021.

²⁶During emergencies and disasters, states and other jurisdictions may request assistance from the federal government as a part of the National Response Framework. This framework is a guide for how the nation responds to emergencies and disasters and includes emergency support functions, each of which covers an area of specific federal resources and capabilities most frequently needed in a national response. Led by ASPR, Emergency Support Function-8 covers public health and medical services, such as medical staffing. For more information on the frameworks that form the basis of federal incident response and crisis action plans, see GAO, *Biodefense: After-Action Findings and COVID-19 Response Revealed Opportunities to Strengthen Preparedness*, GAO-21-513 (Washington, D.C.: Aug. 4, 2021).

Personal Protective Equipment (PPE) Training Videos

The correct use of PPE, such as gloves, respirators, and gowns, helps ensure an adequate amount of protection for the wearer against disease transmission. To reduce the risk of COVID-19 infection among hospital staff, one hospital we interviewed developed and disseminated training videos on the appropriate use of PPE.

According to a hospital official, the training videos (1) helped hospital staff understand how to use the specific types of PPE available to them; (2) minimized the need for staff to meet as a group in person for training; and (3) enabled staff at area health care entities, such as nursing homes, to receive training that otherwise may not have been available.



Hospital staff demonstrating proper use of PPE.

Source: Centers for Disease Control and Prevention (information), one hospital in GAO's sample (information and photo). | GAO-22-105461

- **Staff burnout and low morale.** Officials from multiple hospitals (five hospitals) also discussed staff burnout and low morale among hospital staff. One hospital official said that staff were concerned about working in a hospital setting due to the increased risk of becoming infected with COVID-19, while officials from another hospital said that the prolonged response to the pandemic was difficult and overwhelming for staff. According to a National Academies of Science, Engineering, and Medicine report, health care worker burnout can adversely affect patient care and safety, and can be costly.²⁷ To protect staff and increase staff feelings of personal safety, one hospital official said their hospital provided PPE training for staff and created a staff position dedicated to ensuring proper PPE use.²⁸ According to this hospital official, their hospital was able to avoid job-related disease transmission by taking these steps.

See text box for prior GAO work addressing these staffing challenges raised by hospitals.

Selected GAO Reports Related to Medical Surge Staffing Challenges

Since 2020, we have reported on challenges hospitals experienced during the COVID-19 pandemic, including federal efforts to respond to them. These include the following related to staffing:

- **Behavioral health effects.** In December 2021, we reported that health care workers may be at higher risk of behavioral health effects related to the pandemic due to factors such as fear of contracting COVID-19 or transmitting it to family members and burnout, among others. ([GAO-22-104437](#))
- **Federal medical personnel.** We have reported on the support federal medical personnel provided to hospitals and other health care entities during the pandemic. For example, in June 2020, we reported on the personnel that the Department of Health and Human Services, the Department of Defense, the Federal Emergency Management Agency, and the Department of Veterans Affairs deployed between January and May 2020. ([GAO-20-625](#))

For a list of our previous work, see the Related GAO Products page at the end of this report.

Source: GAO. | GAO-22-105461

Supply challenges. Officials we interviewed from all eight hospitals indicated their hospitals experienced supply challenges during the

²⁷National Academies of Sciences, Engineering, and Medicine. *Taking Action Against Clinician Burnout: A Systems Approach to Professional Well-Being* (Washington, DC: The National Academies Press, 2019, accessed June 1, 2022, <https://doi.org/10.17226/25521>).

²⁸PPE refers to safety products designed to help prevent the spread of infectious disease, such as COVID-19. Examples of PPE include nitrile gloves, N95 respirators, and surgical gowns, among others.

Three-Dimensional (3D) Printing of Face Shields

To ensure their hospital had an adequate supply of personal protective equipment (PPE) despite supply shortages, one hospital official said that their hospital used its 3D print technology to manufacture face shields for staff to use. Hospital officials said that ultimately, they never needed to use the face shields because they never ran out of eye protection. Face shields are a type of PPE that cover the entire face, providing eye protection against COVID-19 and preventing N95 respirators from contamination, enabling their reuse.



A 3D printed face shield.

Source: One hospital in GAO's sample (information and photo), Armijo, P.R., N.W. Markin, S. Nguyen, D.H. Ho, T.S. Horsemen, S.J. Lisco, and A.M. Schiller. "3D Printing of Face Shields to Meet the Immediate Need for PPE in an Anesthesiology Department during the COVID-19 Pandemic." *American Journal of Infection Control*, vol. 49, no. 3 (2021):302-308, accessed June 9, 2022. <https://doi.org/110.1016/j.ajic.2020.07.037> (information). | GAO-22-105461

pandemic. These supply-related challenges primarily included insufficient amounts of supplies—such as PPE, therapeutics, ventilators, and testing materials—according to hospital officials. Hospital officials described some of the effects these challenges had on their hospitals. For example, an official from one hospital said the shortage of testing supplies early in the pandemic hindered the ability to identify COVID-19 cases, and the shortage of therapeutics later in the pandemic limited treatment options for patients. An official from another hospital said that shortages of PPE undermined staff safety and confidence.

Hospital officials also discussed the strategies their hospitals used in an attempt to address supply challenges. For example, an official from one hospital said their hospital made its own sanitizer with available materials when it was in short supply, while an official from another hospital said that their hospital decontaminated and reused PPE to increase its supply. An official from another hospital said during the first COVID-19 wave, their hospital did not have sufficient supplies to appropriately test the fit of N95 respirators on staff. According to the Centers for Disease Control and Prevention, N95 respirators must fit correctly on the wearer's face to ensure adequate protection against disease; verifying that the respirator fits correctly is called fit testing.²⁹ To address this challenge, the hospital official told us they identified a local company able to design and manufacture the product the hospital needed for fit testing. The company was able to start producing the product for the hospital within 1 month.

See text box for prior GAO work addressing these supply challenges raised by hospitals.

Selected GAO Reports Related to Medical Surge Supply Challenges

Since 2020, we have reported on challenges experienced during the COVID-19 pandemic, including federal efforts to respond to them. These include the following related to medical supplies:

²⁹One method of fit testing involves wearing a hood that is enclosed around the head and shoulders to test whether the wearer is able to detect solutions that are sprayed into the hood while wearing the respirator. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, *Hospital Respiratory Protection Program Toolkit: Resources for Respirator Program Administrators*, 2015-117 (Atlanta, GA: revised Apr. 2022), accessed June 9, 2022, <https://doi.org/10.26616/NIOSH PUB2015117revised042022>.

- **Medical supply availability.** In September 2020, we reported that the demands of the COVID-19 pandemic overwhelmed the medical supply chain, causing constraints in the availability of personal protective equipment (PPE) like N95 respirators and gloves, and supplies to test patients for COVID-19. We made three recommendations to the Department of Health and Human Services to improve their efforts to address supply chain challenges and will continue to monitor HHS actions that could help to address them. ([GAO-20-701](#)). In March 2021, we reported that hospital staff we surveyed were concerned about the availability of vaccines, PPE, and testing supplies. ([GAO-21-387](#)) In April 2022, we reported that HHS and its interagency partners were developing plans to implement the *National Strategy for a Resilient Public Health Supply Chain*, and that the department planned to publicly release an annual implementation progress report. ([GAO-22-105397](#))

For a list of our previous work, see the Related GAO Products page at the end of this report.

Source: GAO. | GAO-22-105461

Space challenges. Officials we interviewed from multiple hospitals (six hospitals) indicated that their hospitals experienced space-related challenges during the pandemic. Examples of space-related challenges included lack of available and appropriate spaces to care for patients—such as beds for patients—as well difficulty transferring or discharging patients to other facilities, according to hospital officials.

- **Lack of available and appropriate spaces to care for patients.** According to officials from multiple hospitals (four hospitals), their hospitals did not always have enough beds—including specific types of beds, such as intensive care unit beds—to accommodate all patients. Officials from multiple hospitals (four hospitals) said when possible, they transferred patients they did not have the capacity or capability to care for to other hospitals that had available beds within or outside of their states. In some cases, hospital officials described how their hospitals repurposed spaces inside and outside of their buildings to accommodate additional patients.

Creating COVID-19 Screening Space Outdoors

During the COVID-19 pandemic, officials we interviewed from multiple hospitals (seven hospitals) described how their hospitals took steps to increase the physical distance between staff, patients, and visitors to reduce the chance of spreading COVID-19. In some cases, this included moving hospital operations outdoors so that fewer people were indoors. To minimize the number of people coming into the hospital's building, one hospital official said that their hospital added electricity and heaters to outdoor structures typically used for hunting, known as deer blinds or deer huts, and stationed them in front of the hospital. In the deer blinds, hospital staff screened patients for COVID-19 and prescribed medication.



Outdoor structures used by one hospital for COVID-19 screenings.

Source: One hospital in GAO's sample (information and photo). | GAO-22-105461

For example, an official from one hospital said they created makeshift intensive care units so that they could have enough space to care for additional patients. An official from another hospital said they created an outdoor respiratory clinic where they could test and treat milder COVID-19 cases to reduce the number of patients entering the emergency department, so the emergency department could be reserved for more serious cases. In other instances, officials from three hospitals said their hospitals did not have sufficient negative pressure rooms, which control the air flow in a room to reduce the risk of patients transmitting infectious diseases to other areas of the hospital. To address this challenge, one hospital official said they created temporary walls and hospital units with negative pressure rooms, helping to prevent virus spread and accommodate additional COVID-19 patients.

- *Difficulty discharging and transferring patients to other facilities.* Officials from multiple hospitals (five hospitals) reported that during the pandemic, they had difficulty finding other facilities—such as skilled nursing facilities or other hospitals—for patients they needed to transfer or discharge to receive additional care. For example, as of January 2022, an official from one hospital said all of the hospitals in their area were full, so transferring was not an option for them at that time. An official from another hospital said if skilled nursing facilities had a patient with COVID-19, they were unable to accept any new patients for fear of the virus spreading to the new patient. According to the official, this adversely affected the hospital's ability to discharge patients who needed further care and therefore affected hospital capacity and their ability to accept new patients.

To facilitate patient transfers, an official from one hospital said throughout the pandemic, leaders from different hospitals met regularly to coordinate patient transfers across facilities to help ensure area hospitals would not become overwhelmed and could continue to provide patient care. An official from another hospital said they provided information to state and federal data systems to share information about bed availability across facilities.

Information challenges. Officials we interviewed from multiple hospitals (seven hospitals) reported experiencing information challenges during the pandemic. Examples of information challenges included communications with state and federal officials about PPE use and decontamination, testing, and staff isolation periods; as well as challenges with data and data systems on hospital bed availability and COVID-19 cases.

- *Communication.* Officials from multiple hospitals (six hospitals) said that, at times, communication from state and federal agencies to their hospitals—including communication related to facility space, supplies, or staff—was not consistent, useful, or timely enough to support their COVID-19 responses. For example, one hospital official shared that federal masking guidance was sometimes contradictory across federal agencies, as well as potentially with state or local agencies, forcing the hospital to choose which guidance to follow. In addition, another official from the same hospital stated that, initially during the pandemic, PPE guidance from the Centers for Disease Control and Prevention changed frequently and generated confusion and concern among hospital staff, specifically around the use of N95 respirators and alternatives, such as surgical masks, given supply challenges.³⁰ Similarly, an official from another hospital said the rapid pace of changes in the federal government’s PPE guidance during the pandemic made it difficult for health care workers to keep their knowledge current and adversely affected staff confidence. Finally, an official from another hospital said they lacked sufficient guidance about where to send COVID-19 tests or how to decontaminate N95 respirators when they were in short supply. See text box for examples of other GAO work raising communication challenges during the COVID-19 pandemic response.

³⁰In commenting on a draft of this report, the Centers for Disease Control and Prevention stated that its guidance for the care of patients with COVID-19 infection always included an N95 respirator and, early in the pandemic, included the use of masks and other alternatives only when supplies of N95 respirators were insufficient. The agency also stated that it adjusted health care-specific guidance during the pandemic generally infrequently (e.g., every 3 months) based on the evolving knowledge of the virus and its transmission, and other factors.

Selected GAO Reports Related to Communication Challenges

Since 2020, we have reported on challenges experienced during the COVID-19 pandemic, including federal efforts to respond to them. These include those related to communication and COVID-19 testing:

- ***COVID-19 Testing.*** In November 2020, we reported that COVID-19 testing guidelines changed several times over the pandemic with little scientific explanation of the rationale behind the changes, confusing providers implementing the guidelines and risking the erosion of trust in the federal government. We made one recommendation to the Department of Health and Human Services to disclose the scientific reasoning behind changes in guidance. As of June 2022, the department's efforts to address this recommendation were ongoing. ([GAO-21-191](#)) In January 2021, we reported that the Department of Health and Human Services had not issued a comprehensive and publicly available national testing strategy, creating the risk of partners and the public lacking crucial information to support an informed and coordinated testing response. We made one recommendation that remained open as of June 2022. ([GAO-21-265](#))

For a list of our previous work, see the Related GAO Products page at the end of this report.

Source: GAO. | GAO-22-105461

Officials from multiple hospitals (six hospitals) also discussed strategies they implemented to facilitate communication to ensure hospital staff had the information they needed. For example, one hospital official said they held meetings with groups of stakeholders to help make decisions about infection control procedures, which the group then relayed to hospital infection control staff to convey to front line hospital staff. An official from another hospital said their hospital placed quick response (QR) codes—barcodes that when scanned with a smartphone display information—on hospital walls that showed real-time information on PPE guidance, treatment protocols, and COVID-19 testing to keep health care workers up to date on the latest information and guidance.

- ***Data.*** State and federal data systems and data collection efforts were designed, in part, to help address hospital medical surge challenges—for example, by providing information on hospital space, staff, and supplies—but officials from multiple hospitals (five hospitals) said that issues with state or federal data systems created challenges for their hospitals. For example:
 - According to officials from multiple hospitals (three hospitals), it was burdensome to enter data into multiple systems. Specifically, these officials told us that states had their own data systems into which hospitals reported information about their status during the pandemic. These hospitals, however, also had to input data into HHS Protect, a new federal data system created in April 2020 to

capture information on hospital capacity and resource shortages.³¹ Officials from one hospital emphasized that it took a significant amount of resources to enter data into both state and federal data systems, particularly because these systems have different reporting requirements. According to officials from multiple hospitals (two hospitals), their states eventually streamlined their data collection processes so that hospitals only had to enter data into a single state data system, which officials said reduced the burden for hospitals.

- According to officials from multiple hospitals (two hospitals), the data that hospitals were required to report were not always useful for clinical and logistical considerations. For example, one hospital official said their hospital was required to report to HHS Protect the locations within their facility where the hospital could accommodate additional beds, even though the hospital was likely unable to support those beds due to insufficient staff and other resources. Similarly, an official from another hospital said HHS Protect did not include the information necessary to make decisions regarding patient transfers, as the data on hospital bed availability was not available on HHS Protect in real time. Although HHS Protect collected information on available inpatient and intensive care unit beds, hospital officials said it was still necessary to communicate with clinical and operational staff at the hospitals with capacity in order to ensure that the hospital could accept the patient. See text box for prior GAO work addressing these data challenges raised by hospitals.

³¹According to ASPR, HHS Protect is a data system that serves as a hub for data analysis and visualization across multiple datasets. Hospitals are able to report their COVID-19 information to HHS Protect through several methods, including states or state hospital associations reporting information to HHS on their behalf. In September 2020, the Centers for Medicare & Medicaid Services began requiring hospitals that participate in the Medicare and Medicaid programs to report COVID-19 information in accordance with the frequency and format specified by the agency. 42 C.F.R. § 482.42(e) (2021). This requirement is in effect for the duration of the COVID-19 public health emergency.

Selected GAO reports related to data challenges during the COVID-19 pandemic

Since 2020, we have reported on challenges hospitals experienced during the COVID-19 pandemic, including federal efforts to respond to them. These include the following related to data challenges:

- Hospital capacity data. In August 2021, we reported that the reporting requirements for HHS Protect—developed to capture data from hospitals on COVID-19 cases, bed availability, supplies, and COVID-19 treatments—created challenges for hospitals and that public health stakeholders, and some states relied on state and local data to inform their COVID-19 responses, rather than data from HHS Protect. According to the Department of Health and Human Services, because the system was developed in real-time to respond to the pandemic, it required iterative development over time. The department planned to re-evaluate the data being collected and streamline reporting requirements. ([GAO-21-600](#))

Source: GAO. | GAO-22-105461

According to ASPR's capabilities guidance, having and using a coordinated approach for sharing information and data among response partners during a medical surge response is necessary.³² We added HHS's leadership and coordination of public health emergencies to our high-risk list in January 2022 in part due to deficiencies related to communication, data, and data systems during the COVID-19 pandemic and other public health emergencies.³³

Challenges for rural hospitals. In addition to facing similar challenges experienced by other hospitals during the pandemic, the three rural hospitals in our review encountered additional challenges due to their location and more limited availability of services, according to hospital officials.³⁴

For example, according to hospital officials, fewer beds and specialty services limited their ability to provide care to COVID-19 patients. As a result, officials from rural hospitals said they had to identify other hospitals with the available space and services that could provide the level of care that patients needed. According to an official from one rural hospital, the nearest hospitals that could provide a more complex level of care, such

³²ASPR, *2017-2022 Health Care Preparedness and Response Capabilities*.

³³Specifically, as we reported in January 2022, our prior work identified persistent deficiencies in several areas, including providing clear and consistent communication to key partners and the public and collecting and analyzing complete and consistent data to inform decision-making. See GAO, *COVID-19: Significant Improvements Are Needed for Overseeing Relief Funds and Leading Responses to Public Health Emergencies*, GAO-22-105291 (Washington, D.C.: Jan. 27, 2022).

³⁴According to ASPR and officials from one coalition, critical access hospitals experienced challenges similar to those reported here, including difficulty transferring patients to other facilities to obtain a more complex level of care.

as more intensive respiratory services, were 150 miles away. This meant they typically needed to transfer patients by air. An official from another rural hospital said that in some cases, they sent patients to other states. Transferring patients over great distances was logistically challenging and did not always align with the preferences of patients or their families. For example, officials from one rural hospital said they needed to assess whether there was sufficient oxygen to make the longer trips and in some cases, longer transfer times resulted in emergency transport systems being unavailable in the community for longer periods of time. Further, officials from one coalition said some emergency medical services units did not have proper PPE to transfer COVID-19 patients over such long distances. An official from another rural hospital said it was costly to transfer patients over long distances, and when it was time to transfer patients back to their communities, many patients did not have the resources or stamina for the return trips.

Rural hospitals also faced greater challenges obtaining supplies compared to other hospitals, according to officials we interviewed from a national hospital association. For example, these officials said rural hospitals that did not already have relationships with group purchasing organizations could not obtain any supplies from them, and obtaining supplies was a particular problem for smaller and rural hospitals. Group purchasing organizations support the purchasing of medical supplies and equipment on behalf of groups of providers.³⁵

It is important to note that some of the challenges rural hospitals faced during the pandemic were pre-existing.³⁶ Officials from hospitals and coalitions operating in rural areas described the scarcity of care and staff in their areas. For example, officials from one rural hospital said that it is the only hospital that delivers babies for many miles, and due to limited staff, it was difficult to medically surge in response to increased demand for hospital services even before the pandemic. Similarly, officials from one coalition that operates in rural areas said that in the coalition's 22

³⁵For more information on group purchasing organizations, see GAO, *Group Purchasing Organizations: Funding Structure Has Potential Implications for Medicare Costs*, GAO-15-13 (Washington, D.C.: Oct. 24, 2014).

³⁶In December 2020, we reported on some of the challenges facing rural health care unrelated to the COVID-19 pandemic, noting that residents in areas affected by rural hospital closures had to travel substantially farther to access certain health services. We also found that the availability of health care providers in counties with rural hospital closures generally was lower and declined more over time, compared to those without closures. GAO, *Rural Hospital Closures: Affected Residents Had Reduced Access to Health Care Services*, GAO-21-93 (Washington, D.C.: Dec. 22, 2020).

county coverage area, there are only two acute care hospitals, which may not always have the capacity to receive patient transfers. Officials from another coalition that operates in a rural area shared that the pandemic exacerbated health care staffing issues that existed prior to the pandemic, in particular, for nurses.

Coalition Support for Hospital Medical Surge Challenges Responding to the COVID-19 Pandemic

Officials we interviewed from all eight coalitions in our review described performing one or more response activities during the COVID-19 pandemic to support hospitals, including to address the medical surge challenges noted above. These coalition activities varied from coalitions offering a variety of support to one coalition being inactive during the COVID-19 response at the time of this report.³⁷ See table 2 for examples of how coalitions sought to address hospital challenges and the variation in coalition activities in each of these areas.

Table 2: Examples of Strategies Used by Health Care Coalitions to Address Hospital Challenges during the COVID-19 Pandemic

Type of hospital challenge	Strategies used by health care coalitions to support hospitals
Staffing	<ul style="list-style-type: none"> • Shared information with area hospitals on staffing-related best practices and lessons learned from other hospitals, such as information on splitting shifts between staff so that hospitals could use their existing staff efficiently • Reported to the state information about hospital staffing challenges; according to health care coalition officials, this led to state activation of a staffing center, which provided additional staffing to hospitals
Supply	<ul style="list-style-type: none"> • Compiled hospital resource requests and passed them to the state to be filled • Created a health care coalition-level personal protective equipment (PPE) cache that contained different types of PPE for use by hospitals and other partners • Purchased specific supplies that hospitals needed, including powered air purifying respirators
Space	<ul style="list-style-type: none"> • Organized the logistics for regular conference calls among area hospitals to address a lack of appropriate spaces to care for patients so hospital staff could discuss patient transfers • Contacted other hospitals in the region to try to find beds for patients, upon receiving word from hospitals that they were unable to place patients in their facilities or health systems • Used hospital bed availability data from the state data system to help to identify appropriate places to transfer COVID-19 and non-COVID-19 patients

³⁷ASPR officials told us they learned of the one coalition’s inactive status through ASPR staff responsible for liaising with the coalition’s state public health department. ASPR officials said that this coalition did not receive HPP funding while it was inactive. According to ASPR officials, in response to several issues with this HPP funding recipient, ASPR instituted funding restrictions.

Type of hospital challenge	Strategies used by health care coalitions to support hospitals
Information	<ul style="list-style-type: none">• Participated in state medical emergency operations center meetings and statewide COVID-19 briefings, enabling the health care coalition to share reliable information with hospitals• Developed and disseminated reports on hospital capacity to all local hospitals and emergency medical services to facilitate communication• Trained hospitals on the state's data system to support hospital reporting efforts• Relayed partners' questions about using the state's data system to the state and sent answers back to partners

Source: GAO interviews with a nongeneralizable sample of health care coalitions. | GAO-22-105461

Notes: This table is not exhaustive of all challenges and strategies reported by hospital and health care coalition officials.

Health Care Coalition Engagement in COVID-19 Assessment (Coalition Engagement Report)

The Office of the Assistant Secretary for Preparedness and Response (ASPR) Technical Resources, Assistance Center, and Information Exchange conducted a study to assess health care coalition engagement in response activities during the COVID-19 pandemic.

Issued in December 2021, the goal of the study was to examine health care coalition success stories and provide information about opportunities to help health care coalitions build their preparedness for future emergency events.

The study analyzed information from a survey of ASPR field project officers and 186 health care coalitions, a literature review, and focus groups with 29 health care coalitions.



Source: ASPR Technical Resources, Assistance Center, and Information Exchange, *Health Care Coalition Engagement in COVID-19 Assessment* (Washington, D.C.: December 2021). | GAO-22-105461

Some of our findings on coalition activities during the COVID-19 pandemic are consistent with information ASPR shared with us, as well as findings from a coalition engagement report produced by the ASPR Technical Resources, Assistance Center, and Information Exchange's coalition engagement report.³⁸ For instance, in that report, ASPR reported that coalitions identified information sharing as their most important activity during the pandemic, and that many coalitions helped members to access supplies during the pandemic, such as by maintaining caches of supplies or serving as the main point of contact for resource requests. ASPR's report also found that coalitions had varying levels of involvement in transferring patients across facilities.

³⁸ASPR Technical Resources, Assistance Center, and Information Exchange, *Healthcare Coalition Assessment*.

ASPR's Ongoing Hospital Preparedness Program and Other Efforts to Support Medical Surge Readiness

Efforts and Considerations to Enhance Coalition Capabilities to Support Medical Surge Readiness

To support medical surge readiness, ASPR has multiple ongoing efforts to assist coalitions funded through HPP, including considering potential changes and updates to the capabilities guidance, according to our review of ASPR documents and interviews with ASPR officials. Efforts to support medical surge readiness have included the following.

Providing guidance and technical assistance to coalitions. In addition to providing funding for health care preparedness and response, ASPR offers guidance and technical assistance to help coalitions, hospitals and others to understand the capabilities necessary to effectively prepare for and respond to emergencies. According to ASPR, this assistance is offered through regionally based field project officers and its Technical Resources, Assistance Center, and Information Exchange. According to ASPR's website, the ASPR Technical Resources, Assistance Center, and Information Exchange was created to meet the information and technical assistance needs of regional ASPR staff, health care coalitions, and others working in disaster medicine, health care system preparedness, and public health emergency preparedness. According to ASPR officials, as of December 2021, ASPR had responded to nearly 3,000 requests for technical assistance through this resource, 700 of which were specifically related to the COVID-19 pandemic. This COVID-19 technical assistance included developing resources related to medical surge strategies, such as the following:

- *Medical surge management, including information and recommendations to hospitals on increasing their capacity.* ASPR collected resources focused on increasing hospital capacity, conducted and examined several case studies of hospitals that were treating severe cases of COVID-19 to identify best practices, and shared the findings on the ASPR Technical Resources, Assistance Center, and Information Exchange website, for reference by coalitions, hospitals, and other stakeholders. For example, it found that one hospital examined in these case studies developed ways to

increase the number of isolation rooms by reconfiguring treatment spaces and updating ventilation systems.

- *Clinical resources for physicians.* The ASPR Technical Resources, Assistance Center, and Information Exchange identified clinical resources to assist physicians with medical surge response, such as example policies for documenting patient care during a crisis—called crisis charting—and information on the conditions of individuals experiencing the long-term effects from COVID-19 infection. For example, the use of crisis charting can reduce the amount of information clinicians are required to enter into a patient’s record during medical surge periods, according to ASPR Technical Resources, Assistance Center, and Information Exchange documentation. This, in turn, decreases the amount of time spent recording patient information and increases the amount of time available for patient care. According to ASPR documentation, a provider of health care services viewed these options as a way to mitigate the effects of a medical surge and avoid invoking crisis standards of care.³⁹ According to ASPR Technical Resource, Assistance Center, and Information Exchange officials, the use of crisis standards of care place patients at substantial risk of a poor outcome. Thus, ideally, medical surge is managed in a way that prevents the need to invoke them.
- *Templates for COVID-19 treatment protocols.* The ASPR Technical Resources, Assistance Center, and Information Exchange provided templates for physicians’ standing orders (i.e., written protocols that allow a health care team to complete certain clinical tasks without having to obtain a physician’s direct instruction) for administering monoclonal antibodies to COVID-19 patients. Use of such orders may allow clinicians to have more time to focus on providing more complex care, according to one national physician organization.

Implementing a new medical surge exercise. In 2021, ASPR replaced its previously required HPP annual exercise for coalitions with a new exercise, known as the Medical Response & Surge Exercise, in an effort to further support medical surge readiness. The objective of the new exercise remains the same as the previous one—that is, to test each coalition’s ability to assist in a medical surge event and identify gaps in surge planning. ASPR officials told us they developed the Medical

³⁹The National Academy of Medicine defines crisis standards of care as a substantial change in the usual health care operations and the level of care delivered due to a pervasive or catastrophic disaster. In such situations, the number of patients needing care is more than the amount of resources available.

Response & Surge Exercise in response to feedback that the previous exercise was not flexible enough to respond to different types of possible events, such as the COVID-19 pandemic. For example, according to ASPR,

Importance of Preparedness and Response Exercising

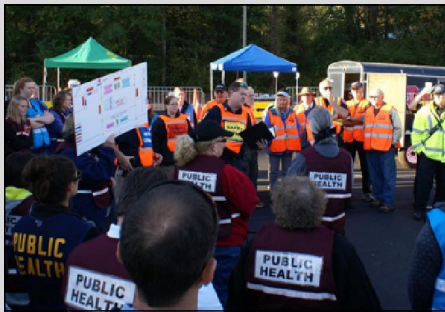


Photo of Georgia's emergency personnel conducting a statewide exercise.

According to the Department of Homeland Security, exercises are the best way to prepare teams to respond effectively to an emergency. Exercises enhance knowledge of plans, allow members to improve their own performance, and identify opportunities to improve capabilities to respond to real events. Therefore, exercises are important for evaluating a preparedness program, testing or validating recently changed procedures or plans, assessing the capabilities of existing resources and identifying needed resources, and increasing awareness and understanding of hazards and their potential effect, among other things. In August 2021, GAO reported on exercise development and conduct among federal agencies. For more information and to see GAO's recommendations in this area, please see [GAO-21-513](#).

Source: Department of Homeland Security, <http://www.ready.gov/exercises> (information); GAO, *Biodefence: After-Action Findings and COVID-19 Response Revealed Opportunities to Strengthen Preparedness*, [GAO-21-513](#) (Washington, D.C.: Aug. 4, 2021) (information); Centers for Disease Control and Prevention (photo). | GAO-22-105461

- The prior exercise simulated an evacuation involving at least 20 percent of a coalition's bed capacity through hospitals or other patient care facilities. In contrast, the new exercise allows coalitions to define and exercise disaster and emergency scenarios that are typical of their geographic area in order to test their ability to respond to events beyond evacuation simulations, assess their specific needs in relation to these events, and identify gaps in resources and personnel.
- The prior exercise was designed to test coalitions' ability to respond to an incident (e.g., transportation accidents or bombings) without prior notice. In contrast, the new exercise removes the no-notice nature of the prior exercise. According to ASPR officials, this change was made to allow coalitions to tailor the exercise to their specific situation and to increase participation in the exercise among coalition members; however, ASPR does recommend that coalitions provide little or no notice of the exercise to their members to more closely mimic real-world situations.

ASPR officials stated that they will establish targets to measure whether coalitions are meeting expectations for the Medical Response & Surge Exercise once 3 years of performance data from the exercise are available.

Updating existing capabilities guidance. To further assist with medical surge readiness, ASPR officials stated the office is working to update ASPR's existing capabilities guidance.⁴⁰ As previously noted, the capabilities guidance informs coalition activities, but it is designed for the entire health care delivery system. As a result, in updating the guidance, ASPR officials said they will request feedback from different types of stakeholders. These stakeholders include frontline health care providers, state and local government agencies, coalitions, and other ASPR programs and leadership, among others. ASPR officials said that their preliminary areas of focus for the updates include the following.

⁴⁰The current capabilities guidance reflects the project period of 2017 through 2022. See ASPR, *2017-2022 Health Care Preparedness and Response Capabilities*.

- *Increased focus on deliberate engagement of and planning for at-risk groups to ensure preparedness and response functions do not exacerbate health care inequities.*⁴¹ According to ASPR, disasters and emergencies such as the COVID-19 pandemic have affected communities of color and underserved populations especially hard. Therefore, understanding the complex relationships that affect fair access to health care during emergencies may be beneficial to health care professionals.
- *Expanded guidance around critical aspects of medical response efforts.* This includes guidance related to hospital load balancing and the use of medical operations coordination centers. According to ASPR documentation, medical operations coordination centers are groups of stakeholders—including health care facilities and emergency medical services, and governmental partners—utilized during the COVID-19 pandemic to facilitate patient movement, health care staffing, and resource allocation within a jurisdiction.
- *Expanded guidance around preparing for and carrying out different types of medical surges.* This can include guidance for medical surges involving pediatric populations, as well as for events with long-term consequences, known as prolonged surge response, according to ASPR documentation. Expanding guidance around pediatric surges is necessary because children have unique physical and behavioral characteristics that make them particularly vulnerable to disasters and emergencies, according to ASPR documentation. ASPR officials stated that planning for prolonged surge responses should account for factors such as staff burnout and illness, including mental health concerns.

ASPR officials said the next update of the capabilities guidance will address insights from the COVID-19 pandemic, but it will maintain its all-hazard focus, encompassing other types of emergencies and disasters that can result in medical surge.⁴² ASPR officials said they anticipate the new capabilities guidance will be updated prior to the release of the notice

⁴¹Preparedness and response functions refer to the emergency support functions used to manage any type of disaster or emergency response under the National Response Framework.

⁴²We previously recommended that HHS, in coordination with its federal and nonfederal partners, define the set of capabilities—separate from those outlined in ASPR’s capabilities guidance—needed to prepare for and respond to nationally significant, whole-of-nation biological incidents like the COVID-19 pandemic. HHS agreed with the recommendation and the department’s efforts to address this recommendation are ongoing. For more details, see GAO-21-513.

of funding opportunity for the next 5-year HPP project period, which begins in fiscal year 2024.

Developing additional support for coalitions. ASPR is considering developing additional support for coalitions based upon information the office gathered from its 2021 coalition engagement report.⁴³ As previously noted, in this report, the ASPR Technical Resources, Assistance Center, and Information Exchange collected information from coalitions on their experiences during the first 2 years of the COVID-19 pandemic. Table 3 provides examples of issue areas in which ASPR is considering developing further guidance or other resources for coalitions, as identified by ASPR in the report.

Table 3: Potential Areas of Additional Support for Health Care Coalitions, as Identified by the Office of the Assistant Secretary for Preparedness and Response (ASPR) Technical Resources, Assistance Center, and Information Exchange

Potential area	Description
Crisis standards of care	<p>ASPR reported that the office could provide additional guidance on how health care coalitions (coalitions) could support provider decision-making during times when crisis standards of care are in use. Crisis standards of care are designed to achieve the best outcome for a group of patients rather than focusing on an individual patient when there is a medical surge.^a This can mean, for example, allocating scarce resources to those patients who are most likely to benefit from their use.</p> <p>Coalition members took a variety of steps to mitigate the need for large-scale use of crisis standards of care during the COVID-19 pandemic, ASPR reported. For example, coalitions reported that their members used strategies to preserve personal protective equipment (PPE), physically alter facility space, and modify staff ratios and roles, thus allowing them to maintain standard care practices by preventing shortages in health care resources. As a result, many coalitions told ASPR they were revisiting their crisis standards of care planning activities, and were looking for guidance and frameworks from ASPR with which they can align their plans.</p>
Medical operations coordination centers	<p>ASPR reported that the office could provide additional guidance to coalitions to better unify how medical operations coordination centers may be used in future emergencies.</p> <p>Use of medical operations coordination centers—emergency operation centers that help coordinate medical responses—were a key success in many coalition jurisdictions, ASPR reported. These coordination centers helped regions avoid invoking crisis standards of care. However, the models used by regions were diverse.^b</p>

⁴³ASPR Technical Resources, Assistance Center, and Information Exchange, *Healthcare Coalition Assessment*.

Potential area	Description
Response roles for rural and urban health care coalitions	<p>ASPR reported that the office could better define urban versus rural expectations for response roles.</p> <p>Coalitions serving rural areas had fewer personnel and resources but played a crucial role in helping to maintain staffing, share information, and provide and distribute PPE and other supplies to their health care facilities and community partners, ASPR reported. According to ASPR officials, coalition goals in rural areas are often very different than those in urban and suburban areas. For example, rural communities do not have the ability to expand critical care space and exercise in the same way as urban communities. ASPR officials also stated that rural facilities and emergency medical services are particularly challenged by staffing issues in ways that urban facilities are not.</p>

Source: ASPR Technical Resources, Assistance Center, and Information Exchange, *Health Care Coalition Engagement During COVID-19 Assessment* (December 2021) and ASPR officials. | GAO-22-105461

^aThe National Academy of Medicine defines crisis standards of care as a substantial change in the usual health care operations and the level of care delivered due to a pervasive or catastrophic disaster. In such situations, the number of patients needing care is more than the amount of resources available.

^bA group of hospitals working together to transfer patients across the health care system may be considered an example of a medical operation coordination center, which refers to a type of emergency operation center focused on the medical response. According to ASPR guidance on establishing and implementing medical operation coordination centers, these coordination centers helped facilitate patient transfers, among other medical response activities, during the COVID-19 response.

ASPR officials said the office continues to gather necessary information to determine how it will incorporate this information and any other lessons learned from the COVID-19 pandemic into future guidance and other resources for coalitions. Officials said they have not yet determined whether any program changes made based upon these areas of opportunity would be reflected in the update of the existing capabilities guidance or influence program expectations in the HPP project period starting in 2024.

Regional Efforts for Promoting Medical Surge Readiness

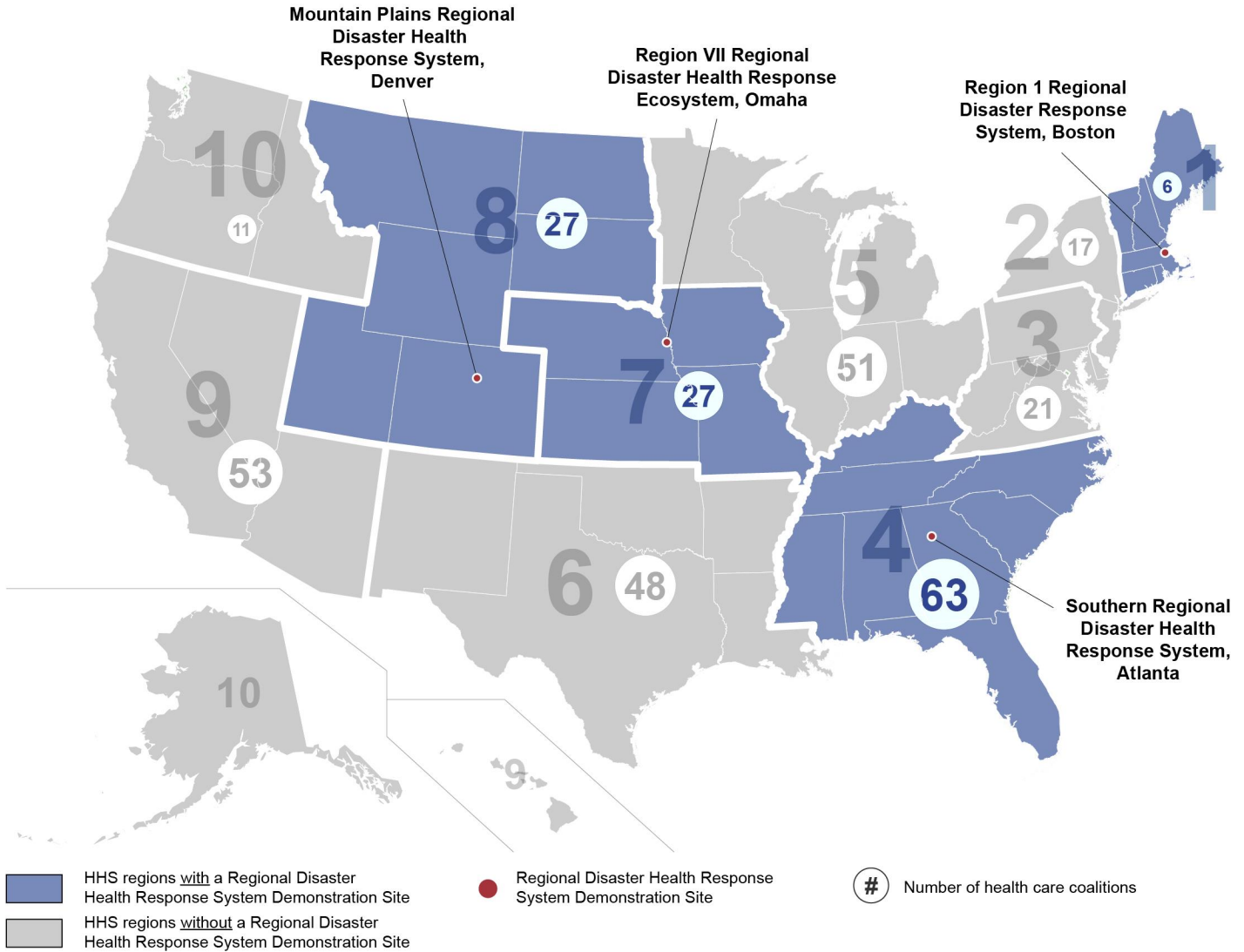
As part of its ongoing efforts to promote medical surge readiness, ASPR is currently involved in funding projects or developing guidelines that will promote regional preparedness and response capabilities across coalitions and states. These efforts include ASPR’s ongoing funding of demonstration project sites in four regions, as well as its effort to develop a set of regional guidelines in response to the PAHPAI Act. The demonstration sites ASPR is funding are pilots to test and evaluate new approaches to multi-state medical surge readiness.

Regional Demonstration Project Sites

To help develop effective approaches to medical surge readiness across multiple states, ASPR has four regional demonstration project sites in

place. (See fig. 2.) According to ASPR, the goals of the Regional Disaster Health Response System demonstration project are to test new approaches, establish regional partnerships to improve disaster readiness capabilities and capacity, increase medical surge capacity, enhance situational awareness, and extend the provision of specialty care. ASPR officials added that the demonstration sites are helping to provide technical assistance in a variety of areas, including related to the promotion and sharing of strategic medical intelligence, clinical expertise, and complex medical management, which have not as of yet been well addressed.

Figure 2: Map of the Office of the Assistant Secretary for Preparedness and Response’s (ASPR) Regional Health Disaster Response System Demonstration Project Sites in Four Department of Health and Human Services (HHS) Regions, and Number of Health Care Coalitions in Those Regions



Source: GAO analysis of ASPR information. | GAO-22-105461

Notes: The Regional Disaster Health Response System demonstration project is funded through ASPR. According to ASPR, the goal of the Regional Disaster Health Response System demonstration project is to test new approaches, establish regional partnerships to improve disaster readiness capabilities and capacity, increase medical surge capacity, enhance situational awareness, and extend the provision of specialty care. For example, according to ASPR documentation, demonstration sites should work to coordinate coalitions within their state and across states in their HHS region, among other things. Health care coalitions are groups of health care and response organizations in a defined geographic location that coordinate emergency preparedness and response activities across their members. The numbers of health care coalitions shown within each

HHS region include coalitions located in United States territories and major metropolitan areas, which are not depicted in this graphic due to spatial limitations. Health care coalition data were obtained from ASPR's website in May 2022 and are based on June 2020 data.

Additionally, according to ASPR documentation, demonstration sites should work to coordinate coalitions within their state and across states in their HHS region, among other things. For example, the Region 1 Regional Disaster Health Response System demonstration site, led by Massachusetts General Hospital in Boston, is developing a disaster telemedicine system to connect clinicians across the region to relevant specialty care, such as trauma, burn, or pediatric care. According to ASPR documentation, some coalition jurisdictions do not have such specialty care in non-emergency times; and during disasters and emergencies, access to such specialty care may become more challenging given the large number of patients that may require services. See table 4 for examples of other efforts as well as the funding history of these demonstration sites.

Table 4: Examples of Ongoing Efforts by Three Office of the Assistant Secretary for Preparedness and Response (ASPR) Regional Disaster Health Response Health System Demonstration Project Sites and Funding History

Demonstration site (Regional Disaster Health Response System funding recipient)	Funding history (fiscal years)	Examples of efforts
Region 1 Regional Disaster Health Response System (Massachusetts General Hospital)	2018: \$3 million 2019: \$1.5 million 2020: \$1.6 million 2021: \$1.5 million	<ul style="list-style-type: none"> Developing a disaster telemedicine system capable of providing peer-to-peer clinical consultation in real time, from disaster subject matter experts to front-line clinicians anywhere in the region for burn, trauma, pediatric, and other disaster medical care. Developing and supporting state-level deployable disaster medical teams that can be utilized at the request of a state to augment local response. Developing a system to mobilize health care subject matter experts and a novel electronic platform to support public health authorities during large-scale patient movement events, such as no-notice mass casualty incidents, hospital evacuations, and capacity crises to identify and utilize all available health care capacity in the region. Identifying and addressing legal barriers to effective cross-jurisdictional disaster response, such as sharing patient care and providing telemedicine across state lines.
Region VII Regional Disaster Health Response Ecosystem (University of Nebraska Medical Center)	2018: \$3 million 2019: \$1.5 million 2020: \$1.5 million 2021: \$1.5 million	<ul style="list-style-type: none"> Developing specialized teams to respond to radiation and chemical incidents. Improving data use, data sharing, and interoperability across the state and region. Developing regional resources, such as (a) calculators to project needed pharmaceutical and burn supplies, and (b) a cybersecurity manual that describes health care facility responsibilities in the event of an attack on the electronic health record system or other technology, which has the potential to affect patient care.

Demonstration site (Regional Disaster Health Response System funding recipient)	Funding history (fiscal years)	Examples of efforts
Mountain Plains Regional Disaster Health Response System (Denver Health & Hospital Authority)	2020: \$3 million 2021: \$1.5 million	<ul style="list-style-type: none"> • Building upon the successes of a Colorado state medical operations coordination center and expanding that model to the region. • Working to enhance capabilities of health care coalitions and to better integrate them at the state and regional levels, including providing resources such as guides and trainings.^a • Developing subject matter expert advisory group guides to demonstrate to other states how to convene a subject matter expert advisory group with core members and incident specific members.

Source: GAO interviews with Regional Disaster Health Response System demonstration site officials, Regional Disaster Health Response System demonstration sites progress reports, and ASPR documentation. | GAO-22-105461

Notes: The Regional Disaster Health Response System demonstration project is funded through ASPR. According to ASPR, the goal of the Regional Disaster Health Response System demonstration project is to test new approaches, establish regional partnerships to improve disaster readiness capabilities and capacity, increase medical surge capacity, enhance situational awareness, and extend the provision of specialty care. For example, according to ASPR documentation, demonstration sites should work to coordinate coalitions within their state and across states in their Department of Health and Human Services region, among other things.

^aHealth care coalitions are groups of health care and response organizations in a defined geographic location that coordinate emergency preparedness and response activities across their members.

In addition to these individual efforts, the demonstration sites included in our sample are also working jointly to develop performance metrics, according to interviews we conducted with officials at these three sites. The purpose of these metrics is to measure demonstration sites' core functions and contributions to regional preparedness and response capabilities and actions to address a medical surge, according to officials from one of the demonstration sites we interviewed. Additionally, these metrics could help to evaluate a region's performance and allow for assessments, monitoring, and readiness designations, among other things, according to ASPR documentation. ASPR officials said that once these metrics have been developed, ASPR will review them and consider any appropriate next steps for their potential use, such as incorporating the metrics into HPP.

According to ASPR officials, the Regional Disaster Health Response System demonstration sites have been successful in bringing coalitions and state partners together to facilitate regional planning and coordination efforts. Bringing these partners together can help develop or strengthen medical surge readiness, including strengthening the connections between the health care delivery system that treats patients and state and local governments that provide administrative services, according to ASPR documentation. For example, according to officials from one demonstration site we interviewed, the site was able to connect with other hospitals and stakeholders across the region, including helping to

address medical supply issues, establish protocols, and provide subject matter expertise, among other things. According to these same officials, the demonstration site provided assistance, such as supporting patient transfer and load balancing across hospitals. Further, one demonstration site's officials explained that early in the pandemic they began convening meetings every 2 weeks with federal partners and the states across their region. These meetings were an opportunity for federal partners to report on what was happening at the federal level while also hearing about the challenges and best practices from states' responses to the COVID-19 pandemic in the region.

Representatives from three coalitions we interviewed expressed generally positive attitudes toward the demonstration sites in their states. For example, coalition representatives in one state said they were initially concerned the demonstration site was duplicating the efforts of coalitions. However, once they began collaborating with the demonstration site in their area and better understood the demonstration project's goals and functions, these coalition representatives said they recognized the potential enhanced coordination these regional projects could provide. For example, officials from this coalition stated that the regional coordination promoted by these demonstration sites has allowed them to work with other poison control centers in the region and form partnerships to develop a chemical response team.

ASPR officials said they are not awarding any new demonstration sites in fiscal year 2022. These officials said they are still assessing the project as a whole and the potential next steps they will take regarding the expansion of the Regional Disaster Health Response System demonstration project.⁴⁴

⁴⁴ASPR officials said they do not plan to conduct a formal assessment of the demonstration project, rather they plan to conduct an internal review of it to inform a longer-term strategy.

Regional Guidelines Required under Statute

The Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019 required the Office of the Assistant Secretary for Preparedness and Response (ASPR) to publish regional guidelines for hospitals and other health care facilities to provide appropriate patient care during, in advance of, and immediately following a public health emergency.

The purpose of these guidelines is to assist facilities in their ability to treat patients and increase medical surge capacity in the event of a public health emergency. The guidelines should reflect differences in facilities' capabilities and capacity to treat patients, among other considerations.

Source: Pub. L. No. 116-22, § 203(a), 133 Stat. 905, 911-13 (codified at 42 U.S.C. § 247d-3c). | GAO-22-105461

Developing Regional Preparedness and Response Guidelines

ASPR officials said the office is in the process of drafting regional guidelines for hospitals and other health care facilities to assist them in their ability to treat patients and increase their medical surge capacity in the event of a public health emergency, as required under the PAHPAI Act. ASPR officials said they are working toward an internal completion date of summer 2022, after which, following approval by the Assistant Secretary for Preparedness and Response and clearance by HHS, the guidelines would be made publically available. ASPR officials did not provide a date for when the guidelines would be made publicly available.

According to ASPR, consistent with the PAHPAI Act, adherence to these regional guidelines will be voluntary. In addition, in developing these regional guidelines, the PAHPAI Act directed ASPR to seek input from various stakeholders, such as health care facilities and providers, and to consider the following:

- feedback related to the financial implications for hospitals, health care facilities, and other entities engaged in regional preparedness planning to implement and follow the guidelines; and
- financial requirements and potential incentives for entities to prepare for and respond to public health emergencies as part of a regional health care emergency preparedness and response system.⁴⁵

ASPR officials stated they are considering options for incentivizing guideline adoption but did not provide any further detail on how any potential incentives would operate in practice. These officials noted that since the guidelines are still in draft form, pre-decisional, and subject to change, it would be premature to discuss operational aspects of the guidelines. They stated their primary focus at this time is on finalizing the guidelines.

Until the regional guidelines are complete, we cannot report on the extent to which they may better prepare entities in planning for and responding to future events, any challenges health care entities may have in implementing them, or how future incentives ASPR develops may help to encourage adoption. We have future work planned to examine ASPR's

⁴⁵42 U.S.C. § 247d-3c(c)(3) and (4).

efforts to further promote health care system preparedness and response capabilities.

Agency Comments and Our Evaluation

We provided a draft of this report to HHS for review and comment. HHS provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Health and Human Services, and other interested parties. In addition, the report is available at no charge on the GAO website at <https://www.gao.gov>.

If you or your staffs have any questions about this report, please contact me at (202) 512-7114 or DeniganMacauleyM@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report.

A handwritten signature in black ink that reads "Mary Denigan-Macauley". The signature is written in a cursive style with a long horizontal flourish at the end.

Mary Denigan-Macauley
Director, Health Care

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Appendix I: GAO Contact and Staff Acknowledgments

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In addition to the individual named above, Shannon Legeer (Assistant Director), Stella Chiang (Analyst-in-Charge), Justin Cubilo, and Mallory Kennedy made key contributions to this report. Also contributing were Kaitlin Farquharson, Laurie Pachter, Cynthia Khan, Sean Miskell, Brandon Nakawaki, and Ethiene Salgado-Rodriguez.

Related GAO Products

COVID-19: Current and Future Federal Preparedness Requires Fixes to Improve Health Data and Address Improper Payments. [GAO-22-105397](#). Washington, D.C.: April 27, 2022.

COVID-19: Significant Improvements Are Needed for Overseeing Relief Funds and Leading Responses to Public Health Emergencies. [GAO-22-105291](#). Washington, D.C.: January 27, 2022.

Behavioral Health and COVID-19: Higher-Risk Populations and Related Federal Relief Funding. [GAO-22-104437](#). Washington, D.C.: December 10, 2021.

COVID-19: HHS's Collection of Hospital Capacity Data. [GAO-21-600](#). Washington, D.C.: August 5, 2021.

Biodefense: After-Action Findings and COVID-19 Response Revealed Opportunities to Strengthen Preparedness. [GAO-21-513](#). Washington, D.C.: August 4, 2021.

COVID-19: Continued Attention Needed to Enhance Federal Preparedness, Response, Service Delivery, and Program Integrity. [GAO-21-551](#). Washington, D.C.: July 19, 2021.

COVID-19 Pandemic: VA Provides Health Care Assistance to Civilians as Part of the Federal Response. [GAO-21-395](#). Washington, D.C.: May 20, 2021.

COVID-19: Sustained Federal Action Is Crucial as Pandemic Enters Its Second Year. [GAO-21-387](#). Washington, D.C.: March 31, 2021.

COVID-19: Critical Vaccine Distribution, Supply Chain, Program Integrity, and Other Challenges Require Focused Federal Attention. [GAO-21-265](#). Washington, D.C.: January 28, 2021.

Rural Hospital Closures: Affected Residents Had Reduced Access to Health Care Services. [GAO-21-93](#). Washington, D.C.: December 22, 2020.

Related GAO Products

COVID-19: Urgent Actions Needed to Better Ensure an Effective Federal Response. [GAO-21-191](#). Washington, D.C.: November 30, 2020.

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Public Health Preparedness: HHS Should Take Actions to Ensure It Has an Adequate Number of Effectively Trained Emergency Responders. [GAO-20-525](#). Washington, D.C.: June 18, 2020.

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