Learning from the COVID-19 pandemic to prepare the commonwealth for the next public health emergency

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A MESSAGE FROM **MHA'S PRESIDENT AND CEO**

A STORY OF RESILIENCE AND ADAPTATION

We are proud that Massachusetts is home to the finest healthcare community in the world. But even for a state as advanced and innovative as the commonwealth, nothing could have prepared us for the crisis that emerged in early 2020. What followed has been a long two years of unrelenting challenges, extraordinary resilience, and historic collaboration. Yet, even today, the remnants of this public health crisis can still be found in every neighborhood and healthcare facility across the state.

Massachusetts' response has been nothing short of remarkable. But our ability to weather the storm and avoid some of the dire scenarios seen in other states is no accident. It has taken a monumental effort from each component of the healthcare sector to come together, leverage every resource and bright mind within our reach, and take on the pandemic with a united front. It is also due to the outstanding level of support from Governor Charlie Baker's administration and state legislators, who showed up for healthcare organizations and their patients in countless ways during the darkest hours of the pandemic.

There was, of course, a barrage of new challenges for healthcare providers to confront, but they also needed to navigate longstanding issues such as workforce shortages and a systemic behavioral health crisis. Providers spared no cost or effort to stay open and accessible to the millions who rely on their care, while placing even greater urgency on health equity and public trust. None of this would have been possible without their ability to lean on one another, partner with policymakers, and adjust to the unique needs of their patients, workers, and communities.

As we emerge from the pandemic, our world-class healthcare system is forever changed. The commonwealth's provider organizations, top-tier academic institutions, and government partners are all committed to using the lessons learned during COVID-19 to usher in this new era and to better prepare for future public health emergencies. We believe the lessons outlined in this report are instrumental in doing just that.

Thank you for your support of our healthcare community. We welcome you to be a part of this conversation as it continues in the months ahead. On behalf of all our MHA members, we dedicate this work to the healthcare professionals who have shown up every day to face this crisis head-on and have saved countless lives along the way.

Steve Walsh,
President & CEO
Massachusetts Health & Hospital Association

We must not lose sight of lessons learned

Now more than two years into the COVID-19 pandemic, the Massachusetts healthcare system has gained insight into which response efforts worked, which approaches fell short, and how to refine strategies around the ongoing crisis and better prepare for the next public health emergency.

With this charge in mind, the Massachusetts Health & Hospital Association (MHA) facilitated a project aimed at identifying critical success factors and lessons learned from the healthcare system's response in confronting the pandemic. In November and December 2021, MHA convened 11 virtual roundtable discussions with healthcare leaders and representatives from a wide range of functional areas across the healthcare ecosystem. Supplementing these roundtables, MHA also distributed an accompanying questionnaire. **Overall, 175 leaders from 54 organizations in the commonwealth participated in roundtable discussions and 127 questionnaires were completed.**

MHA used insights from the roundtables and questionnaires to develop a robust set of recommendations that will help a broad range of stakeholders better prepare for the next crisis. These stakeholders include the Massachusetts healthcare system at large; local, state, and federal governments; individual hospitals and healthcare organizations; and others, including employers, payers, and community organizations.

Additionally, MHA organized a number of one-on-one interviews with hospital and health system CEOs, state government officials, and other healthcare leaders. This report derives its findings from those panel discussions, questionnaires, and interviews.

Taken together, the insights gathered reveal that — to better respond to the ongoing crisis and prepare for future public health emergencies — healthcare leaders, caregivers, communities, and the commonwealth must maintain a far-reaching conversation that improves inclusion and encourages continuous planning at every level of the system.

Effective leadership, dedicated funding, and efforts across the system can enhance this inclusion and inform "best practice" policies. The knowledge exchange that emerges can also be leveraged to better understand and address gaps in capacity and care equity over the long term, both in times of peace and crisis.

This report shows how applying these lessons across five key areas — partnerships, care delivery, people, information, and supply chain — will shape a resilient, equitable, collaborative response to a future public health emergency, whether that's another pandemic, mass-casualty event, climate change disaster, or any other imaginable scenario.

LEARNING FROM EACH OTHER

11
Roundtables held

175
Leaders participated

54
Organizations represented

127
Questionnaires completed

274
Lessons learned shared

9
CEOs interviewed 1:1

4
State leaders interviewed 1:1

Massachusetts is uniquely positioned to prepare and respond to crises

The fractured federal response, a barrage of new coordinating responsibilities at the state level, and gaps in emergency response left the commonwealth underprepared for a crisis of this magnitude. To fill in the cracks, hospitals and health systems stepped in wherever needed to address critical public health needs, including COVID-19 testing and vaccination. Amid the chaos, healthcare organizations, the government, and communities came together to adapt and handle the problems in front of them in ways they hadn't before.

President and CEO, health system:

"We realized that, before the pandemic, we did not have the statewide system required to respond to a statewide problem. We appreciate that, with the help of MHA and the state, we made one."

Perhaps the biggest takeaways from the pandemic experience are, first, that the interconnectedness of healthcare organizations, government, and community is critical, and second, that there is unparalleled value in good communication, collaboration, and joint planning before, during, and after a crisis.

The pandemic elevated care providers' position as vital, trusted sources of information in their communities. Fulfillment of this responsibility was both proactive and reactive as healthcare organizations reaffirmed their leadership in this role, while also being directly sought after for guidance by other organizations, including restaurants, entertainment venues, and sports teams. At the same time, the pandemic brought longstanding and worsening healthcare inequities into sharp focus as the virus took a more severe toll on disenfranchised populations.

Effective statewide collaboration requires conveners.

Healthcare leaders report that their collaboration and the trust it built was foundational to the success of their pandemic response. MHA served as a nexus of the response, as a convener, and as an important source of truth and problem-solving for the healthcare system at large. It provided a safe, neutral place to ask questions, share information, coordinate, address issues, and advocate with a unified voice. To that end, MHA hosted frequent CEO calls; engaged in consistent dialogue with the Secretary of Health and Human Services and the state's command center team; organized and led workgroups to address critical areas regarding post-acute care transitions, hospital capacity, vaccines, and clinical issues; quickly stood up a statewide data reporting platform for bed capacity and availability and behavioral health boarding; and helped secure critical flexibilities and waivers. Variations between regions, along with shifts in virus hotspots, made regional relationships and collaboration necessary to address local needs and develop solutions that worked within each community. This regional approach was also critical to bed capacity data sharing, collaboration, and problem-solving.

Government and health systems are interdependent during crises.
Strong relationships between healthcare organizations, MHA, and the state prior to the pandemic translated to strong collaboration, coordination, and communication throughout the pandemic. State leadership was open and collaborative, and they responded to the needs of healthcare organizations based on both direct feedback and real-time data. These linkages were vital for information gathering and dissemination, policy changes and guidance, and funding and resource allocation. This was evidenced by the ability to secure significant and timely waivers and regulatory flexibilities when needed, including those for credentialing, surge spaces, staffing, prior authorization, and liability protections.

Community partnerships are critical to an equitable response.
As provider organizations witnessed the disproportionate effect the crisis was having on disenfranchised populations, they drew upon their ability to identify those populations and leave no one behind. To do so, they created and strengthened partnerships with community groups, churches, and other local organizations to better understand people's needs, build trust, and identify barriers so they could tailor messages and solutions accordingly. In parallel, many healthcare organizations used their purchasing power to expand support to diverse businesses within the communities they serve.

External communication is not one-size-fits-all.
The pandemic compelled providers to reach out to the entire community frequently and expeditiously, with vital messages about care and visitation policy changes, testing and vaccination eligibility and access, and supplies and support needs. Hospitals partnered with MHA and the state to develop common messaging to ensure the healthcare system and its partners were all speaking with the same voice. However, different populations faced different obstacles to obtaining and acting on information and therefore require different approaches. Successful messaging campaigns used different channels such as print, radio, television, door-knocking, and outreach in gathering spaces (e.g., churches) by trusted leaders to target and engage underserved communities.

RECOMMENDATIONS

Define and understand the spectrum of public health emergencies.
Healthcare leaders voiced concerns that prior public health emergency response planning, training, and readiness exercises with command center involvement were insufficient for a crisis of this magnitude and duration. The first step in addressing this problem is defining the true spectrum of possible public health emergencies to inform the scope of planning and resources required. Managing this endeavor requires clear ownership to avoid duplication of efforts, accelerate decision making, and ensure continuity. Stakeholders, both inside and outside the healthcare system, must be deeply involved in the entirety of the planning process, and they each need to understand their roles during health emergencies. Notably, clinical and operational representatives with deep process and healthcare system expertise must be present in the design, exercise, and evaluation of plans to provide valid input on assumptions, response viability, and execution challenges. The Department of Public Health (DPH) should examine how it can eliminate silos and better integrate its plans and systems with those of the healthcare system. The state should convene representative groups of external experts during pre-event emergency planning and at the outset of any public health emergency.

Only half of respondents are confident* about their organization's preparedness for the next emergency:

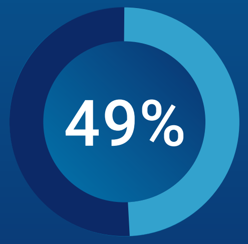
QUESTION 1

To what extent has what you learned helped shape your plans for the next public health emergency?

69%

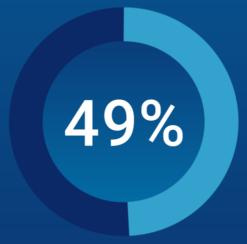
QUESTION 2

To what extent have you created or updated your plans for the next public health emergency?



QUESTION 3

To what extent do you feel your organization is prepared for the next public health emergency?



*Percentages reflect the proportion of respondents that selected "A lot" or "A great deal" for each question.

Bolster emergency response training and regional readiness.
Emergency response exercises at the facility, system, regional, and state level are needed at regular intervals. Regional and state-level exercises require support and organization from the state, and these efforts should be enhanced to be more robust, predictable, and inclusive. Regional preparations among healthcare providers should cover common response protocols, load-balancing, supply chain contingencies, and crisis standards of care, as appropriate. While the state's six regional Health and Medical Coordinating Coalitions (HMCCs) have the potential to better support these functions regionally, they require additional expertise and responsibilities to do so effectively. Staffing and expertise within HMCCs should include individuals with healthcare operations and data expertise from across the care continuum, and be provided with access to the state's emergency data infrastructure. As a vital organ of any effective regional capacity management, EMS and other transportation providers should also have a seat at the table.

Archive best practices, new workflows, and playbooks.
Healthcare organizations developed best practices and guides for many aspects of disaster response, including creating drive-through testing and vaccination sites, standing up field hospitals, designing new processes for care delivery and patient transfers, and updating workflows for operational disruptions and crisis standards of care contingencies. These lessons need to be codified, organized, and stored in an accessible manner so they can be quickly referenced, replicated, or adapted when the next emergency strikes. Likewise, having a directory of all waivers and flexibility enacted during the pandemic could be useful for reference in future emergencies.

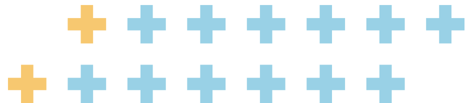
Coordinate across the entire care continuum.
To maximize the state's potential, collaboration between peer institutions, large and small organizations, and providers across the care continuum that arose during the pandemic must continue and deepen. Key players along the continuum include: primary care, tertiary care, long-term care, post-acute care, behavioral health, home health, senior care, and healthcare transportation. While much progress has been made, providers found it challenging, for example, to navigate differing guidance from DPH, the Department of Mental Health (DMH), and other state agencies. In addition, state and regional emergency response partnerships should be formalized.

Leverage the state's renowned healthcare, research, and tech expertise in creative ways.
Massachusetts is uniquely positioned — perhaps in a category of one — as both a world-class healthcare destination and a renowned biotech hub with leading hospitals, researchers, and innovators. At the start of a public health emergency, a state-level "think tank" should be established, consisting of experts from across the state, to engineer a response and develop communications and recommendations on behalf of the commonwealth. MHA should continue its role in convening experts, much as it did with vaccines, testing, blood supply, and clinical guidance. In parallel, public-private and cross-sector partnerships should be incentivized to innovate and respond to dynamic crisis situations. One example of such a partnership was the Massachusetts Manufacturing Emergency Response Team ecosystem, which addressed needs in personal protective equipment (PPE), testing, and essential supply chains that advanced manufacturing research, innovation, and technology validation. Another example is the collaboration between providers and the Broad Institute that facilitated quicker turnaround times for test results and enabled caregivers to get cleared for work.

Build on the HICS and EOC structures' success.
Hospital incident command systems (HICS) and emergency operations center (EOC) structures were critical to the response. Provider organizations should identify and share success factors that enabled them to sustain prolonged incident command activity. HICS and EOC structures may also benefit from seeking additional health equity and communications representation at the table.

Care delivery will be forever changed

As awareness dawned about COVID-19's virulence and ease of transmission, care providers had to make quick decisions about human safety and care delivery before anyone knew how the virus worked or how to treat it — and without any vaccine to ward against infection. They rapidly deployed safety protocols for staff and closed their doors to visitors to prevent in-facility transmission; navigated necessary but disruptive curtailments to planned procedures; addressed how to allocate finite resources; and shifted to telehealth for select service offerings so patients could have a different channel of access. Still, the surge in cases created enormous capacity problems. Rapid action resulted in positive outcomes and challenges, both of which generated insights for the current crisis and future emergencies.



President and CEO, health system:

"Healthcare will never be the same. The fundamental operations of healthcare systems have changed."

Telehealth has solidified its value in care delivery.
Care providers found themselves facing an influx of severely ill COVID-19 patients while still needing to care for patients with other urgent and emergent needs. Their remarkably fast pivot to telehealth, empowered by expanded payment, freed essential inpatient space to help meet those needs and to maintain access to primary, behavioral health, and other types of care in a way that was safe for patients and staff. Clinicians who had contracted COVID-19 themselves or had to quarantine often went beyond the call of duty to offer telehealth visits from a remote location. Other virtual modalities, like remote monitoring and hospital-at-home models, also helped acute care hospitals address capacity problems.

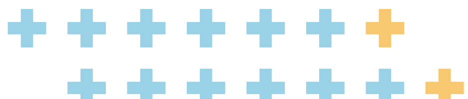
Emergency response is a cross-continuum challenge.
Lockdowns, spurred by the severity and contagiousness of the virus, quickly stalled patient transfers between the various players along the healthcare continuum — a clear indication that what happens in one segment of the healthcare system affects the entire system. The breakdown exacerbated patient capacity problems and severely strained emergency departments. Certain care specialties, such as pediatrics, behavioral health, post-acute treatment and home care, didn't get the attention they needed early on. The often-siloed nature of the care continuum was not ideal for the sharing of ideas and resources. Only when coordination began to span across provider types did the situation improve, showing that cross-continuum collaboration plays an essential role in ensuring people can access care in the right place at the right time.

The downstream impacts of the crisis were important to anticipate.
Healthcare organizations learned that they must anticipate and quickly plan for the downstream and secondary effects public health emergencies can have on the community, such as behavioral health, health inequities, and deferred care. Providers witnessed that large-scale medical crises cause proportional emotional crises, and that the deferral of medical care has significant

clinical consequences. The secondary impact of public health emergencies is especially difficult to plan for when dealing with persistent, longitudinal crises like COVID-19. These impacts further strain healthcare facilities, which are often still addressing the primary effects of the same crisis.

Government flexibility is a pillar of effective emergency response. Provider organizations' successful response to the pandemic relied on the ability to secure significant, timely waivers and regulatory flexibilities from the state and legislature. This included waiving a number of regulations that posed barriers to opening up bed capacity and ensured patients were able to receive care in the right setting. Payment parity for telehealth visits and the expansion of covered services and modalities empowered providers to rapidly make that shift to virtual care. The suspension of strict credentialing and licensing rules expanded the pool of caregivers as caseloads surged, and waivers granted providers more freedom around capacity and transitions from acute to post-acute care, again opening inpatient beds.

Surge capacity creation was central to Massachusetts' response. Many healthcare organizations in Massachusetts were able to create surge spaces and capacity that equaled or exceeded their expectations. This was partially enabled by collaborations between facilities to address capacity constraints regionally. Despite this general success, the provision of healthcare services was often limited due to capacity, equipment, and staffing constraints. In some cases, equipment was available but the requisite room infrastructure was not. In others, the right room was available but specialized setup to treat pediatric or behavioral health patients was lacking. While healthcare surge capacity will continue to be most limited by staffing, physical plants also play an important role.



RECOMMENDATIONS

Encourage continued telehealth adoption and investments.
Signs are emerging that some payers may want to move away from payment parity and other solutions that enabled remote care. Healthcare leaders urge the continuation of payment parity and other proven measures, through legislation if necessary. Audio-only visits, when appropriate, are often preferred and should be considered equal to video visits from a reimbursement and regulatory leniency perspective, as they are especially critical to behavioral health, rural, and marginalized populations. The broadband infrastructure for virtual care delivery should continue to be expanded, and strategies should be deployed to promote widespread physician adoption, including the refinement and dissemination of new workflows. The telehealth delivery model should continue to improve, and its effect on care quality should be closely monitored.

Address digital equity with a cross-sector response.
Telehealth relies on people's digital literacy and access to digital devices and connectivity — both of which are lacking among those who were hit hardest by COVID-19. The digital divide must be addressed for telehealth to reach its full potential and avoid worsening existing care inequities among minority and underserved populations. For pediatric patients, school-based virtual health programs should be funded and offered, especially in communities where digital inequities and barriers to care are the most severe.

Expand surge capacity and facility flexibility across the continuum.
State and healthcare leaders should work together to codify best practices and workflows related to the enablement and rapid deployment of sustainable surge capacity across the healthcare ecosystem. This means identifying and ensuring alternative healthcare facilities are ready for temporary mixed use, including critical care outside of ICUs, and non-acute, sub-acute, behavioral health, and post-acute care. In addition, healthcare leaders should consider a range of future disaster needs in new facility construction and upgrades to accommodate the needs of patient isolation, climate impacts (e.g., flooding, wind, heat, etc.), security threats, and community-based care.

Incorporate behavioral health into emergency planning.
Even before the pandemic, the healthcare system lacked the capacity and workforce to address the commonwealth's behavioral health needs, which have been systemically underfunded. Although telehealth helped to expand access, the COVID-19 crisis sparked a delayed bolus of demand, as well as a striking demand in acuity, for which the system and its regulatory agencies did not have an effective solution. Moving forward, better coordination between DPH and DMH is needed to ensure that guidance is specific enough to different patient populations and care settings, and considers the unique needs of behavioral health patients. Additional resources are necessary to build capacity and incentivize entry into the behavioral healthcare workforce to address the mental health pandemic. Furthermore, sustainable funding and reimbursement for care is required, much like the state-run plans offered during the pandemic, including payment for patients as they board in hospitals.

Leverage the use of waivers and regulatory flexibility.
The capacity crisis remains due to continued workforce shortages and patient demand for care that was put on hold during the pandemic's worst phases. Yet several waivers that gave healthcare organizations the flexibility they needed for care delivery, staffing, and patient transitions are set to expire. The long-term utility of these waivers should be closely evaluated, and those that are relevant should be extended permanently, such as those related to minimizing administrative barriers and encouraging administrative redesign. Waivers should be organized and saved in a centralized repository so they are ready at a moment's notice for future emergencies. Considering the broad spectrum of possible public health emergencies, it is important to define the circumstances under which each waiver would be deployed. In parallel, relationships between providers and payers need to tackle the inefficiencies around pre-authorization and reporting that contribute to care continuum bottlenecks.

Healthcare workers are foundational to emergency preparedness and response

Since the pandemic began, healthcare professionals have gone above and beyond the call of duty to care for their communities. Faced with uncertainty about the virus itself and the crushing demand it created, many risked their own health to keep the delivery system running. Healthcare leaders worked closely with frontline staff and had to act fast and adjust policies and practices, redeploy staff, and change the pace and channels of communication, all while the ground constantly shifted under their feet. The crisis offered lessons about how to lead, communicate, recognize, and tap into staff expertise, as well as the need to respond to the toll this crisis is taking on employees.

The right people must be involved in decision-making.
Early in the pandemic response, healthcare organizations and governments faced the impossible choice between making decisions efficiently to maximize impact or applying the same rigor to due diligence as they do in less dire circumstances. This trade-off was managed with varying levels of success – sometimes prioritizing speed, sometimes prioritizing inclusiveness, sometimes achieving neither. As a result, certain policies failed and had to be adjusted or dropped entirely, creating confusion within organizations and the community. Getting to the right level of speed and inclusiveness requires both long-term strategies for planning and engagement, and thoughtful management in the heat of the crisis. This includes ensuring the representation of frontline workers, operational experts, and health equity leaders. In a similar vein, provider organizations may want to bring community perspectives into their emergency planning processes. Cross-sector knowledge transfer for crisis planning and response has become commonplace, with many national examples proving its benefits. However, this type of collaboration has unmet potential – for example, the potential for healthcare providers to partner with technology leaders and tackle the growing cybersecurity threat.

Transparent, frequent communication is crucial.
Healthcare communications adapted to better combat crisis-induced confusion and misinformation. To communicate the magnitude and frequency of change to their employees, organizations established a single voice of authority and moved beyond email and into mediums like virtual CEO town halls, Facebook groups, SMS messages, and specialized webpages. This apprised staff of change; fostered structured, predictably-timed content; provided employees an open forum to offer feedback and suggestions; and maintained morale. However, information overload was recognized as an active concern. Lastly, the increased internal use of translation and interpretation services is here to stay and should be considered in emergency planning.

Survey respondent:

"The effectiveness at our institution was driven by an overwhelming sense of collaboration and coordination. All staff, especially those on the frontline, rose to the call and went above and beyond to support the needs of the hospital."

Employers had no choice but to get creative.
Systemic and worsening workforce shortages, exacerbated by a multitude of factors – including illness, family obligations, and travel employment opportunities – occurred in parallel to the creation of pandemic-specific roles, such as drive-through testing attendants and vaccination staff. While some of these new roles were filled by volunteers, much of this workload fell to frontline workers with existing responsibilities. For those more traditional roles, solutions like pre-credentialing, activating retired and foreign-trained clinicians, and deploying medical and nursing students as appropriate were essential for temporary relief. While staff shortages necessitated cross-role flexibility within the provider setting, not all roles could be flexed. Still, continually cross-training staff and keeping a current record of employee skills for redeployment when needed was widely recognized and adopted as a best practice. To reach that goal, many providers deployed surveys to inquire about past and current skills and experience in clinical expertise, nursing expertise, and support services.

Burnout and turnover were exacerbated.
Healthcare workers are known for their resilience. However, more than two years and counting of nonstop demands and the emotional strain of caring for and losing so many COVID-19 patients, all compounded by pandemic-related home-life and family well-being stresses, have taken an enormous emotional toll on personnel at every level of the organization. Providers have accelerated initiatives to address the resulting increase in employee burnout and turnover. Some measures, like removing all non-essential activities during surges, were adopted widely. Other initiatives include stress first-aid programs, resilience carts, peer support programs, group sessions, childcare support, and individual support sessions with behavioral health clinicians with an opt-out model to remove the stigma often associated with seeking such care. While much attention is deservedly placed on frontline workers, it is important to recognize administrative and clinical leaders for their contributions. Leadership talent is at a premium in the field, and healthcare needs to remain a desirable career path for young leaders in Massachusetts.

Survey respondent:

"The ongoing capacity and workforce challenges pose real threats to our ability to respond to the next public health emergency. These require a commonwealth-wide assessment and discussion as these issues are not limited to any single institution."

RECOMMENDATIONS

Identify ways to quickly expand the healthcare workforce to meet surge needs and expand the pipeline for the future.
The state's healthcare system needs to build a structure and reserve capacity for staff through provider coalitions or partnerships with institutions of higher learning to better prepare for public health emergencies. While caregiver reserves are likely to be prioritized, this structure should also include other roles that power the care continuum, including behavioral health and transportation professionals. To the extent possible, triggers for activation of reserve staff, along with the logistics of their deployment, should be codified within statewide emergency planning and drilling activities for both general and specialized roles. These efforts should include the identification and mitigation of regulatory barriers to staffing flexibility across the care continuum and state lines. Examples include enabling paramedics to deliver certain types of home care and creating a single credential that allows doctors to provide telehealth services across the continuum. The regulatory enablement of digital health capabilities must be prioritized to increase caregiver flexibility and improve the staffing efficiency of care delivery. Where needs remain, provider organizations should sustain their relationships with third-party staffing partners and work with federal partners to address significant flaws within the travel staffing model.

Reimagine how to support and deploy a limited workforce.
Healthcare was experiencing a concerning shortage of healthcare workers before the pandemic. The problem has only worsened and is now spreading to non-clinical roles, such as administration, information technology, transportation, and environmental services. The workforce is foundational to every aspect of the healthcare system — its resilience should be recognized by committing to priorities like flexible staffing models, having caregivers working at the top of their licenses, and offering easily accessible behavioral health services and childcare support. Since progress to grow the workforce pipeline will not happen overnight, organizations need to optimize workflows and use technology where appropriate to increase providers' patient care capacity. At the same time, healthcare organizations need to train employees in advance of disaster scenarios in competencies such as PPE use and surge care.

Alleviate employee strain.
The enormous toll the pandemic is taking on employees has driven burnout and staff shortages. To address the problem, healthcare organizations should continue to evolve expectations of an appropriate work-life balance for employees by allowing them to "unplug" from work in their off hours. Other measures include offering flexible scheduling and wraparound services like child care, family care support, and financial guidance. Additionally, using a team-based care delivery model places less burden on any single healthcare worker.

Advancing data and analytics is essential

Massachusetts is renowned for its wealth of healthcare data and analysis, with a strong infrastructure in place to regularly collect information from providers. However, even this infrastructure was not designed for the unprecedented data demands of the pandemic.

Establishing common definitions requires close collaboration.

Given that existing systems were not designed to collect data at the scale and pace needed, the state worked closely with MHA and healthcare providers to standardize data definitions (such as specific bed types, staffed beds, and surge beds). This system became complicated by new reporting requirements from the federal government, making further adjustments necessary. To reduce the administrative burden on providers, the state served as a clearinghouse for the collection of data that went to the federal government on behalf of all organizations.

Nuanced data was difficult to convey.

Even with agreement on standard definitions, data collection did not enable facilities to capture and report their specific capabilities. Bed capacity measures cannot capture the difference in the skillset or care services available at each institution, such as extracorporeal membrane oxygenation (ECMO). These nuances can be critical to patients in need of specialized care.

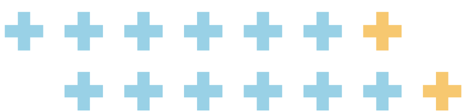
Existing systems were not built for real-time data analysis.

Widely used platforms required manual daily data entry, placing a heavy administrative burden on staff — especially within smaller facilities. They also could not produce real-time data, which posed challenges in making urgent, dynamic assessments and decisions. In addition, a lack of regional dashboards and situation awareness tools made rapid decisions even more challenging.

Collection of health equity data is essential.

Within the initial wave, there was a need to track and report COVID-19 data by race, ethnicity, zip code, age, and other important categories. Both the state and healthcare organizations implemented these measurements into their regular reporting structures.

Tracking social determinants of health data, such as reliance on public transportation and the prevalence of multi-generational and multi-family homes, would have identified disenfranchised populations sooner and allowed for a more targeted response.



Invest in improved emergency data infrastructure.
Massachusetts needs to invest in a robust statewide information management system for data collection, analysis, and dissemination to rapidly support the healthcare system's response to emergencies. Such a plan needs to be adaptable enough to address the full spectrum of possible public health emergencies, and simple enough to be meaningful in content, integrity, and value to stakeholders. The data elements needed to measure and manage the breadth of disaster events must be prospectively identified. Those elements must be built into data collection systems, and reporting capabilities must be capable of meeting the predictable needs of frontline and governmental leaders. Data collection efforts should be expanded beyond hospitals and health systems to the broader healthcare continuum, including long-term care facilities, home care, rehabilitation hospitals, and behavioral health facilities.

Establish a real-time situation awareness tool.
A robust, dynamic situation awareness tool to capture critical resource metrics would be ideal. Such real-time information would allow for rapid analysis, actionable insights, patient movement, and the allocation of resources. Core data elements that are applicable to a broad range of emergencies – like bed capacity and availability – could be supplemented with emergency-specific data elements and facility capabilities. These data are required for the effective functioning of medical operations coordinating centers (MOCCs). MHA and its members are currently exploring potential tools to support such a system. Funding is required to tackle the uphill battle of implementation, security, sustainability, and interoperability with varied electronic health records. Accordingly, investments in training, resources, and capabilities across the care continuum are needed to better prepare for the next public health emergency.

Standardize definitions at the state and federal level.
Coordination is needed between the federal government and all states to establish critical standard definitions for reporting purposes. Organizations should familiarize themselves with such definitions and seek to align their internal vocabulary with the broader consensus. Nuances in terminology across the care continuum and for specialized facilities should be recognized and highlighted.

Survey respondent:

"While information management in the commonwealth has improved in the past two years (outpacing many other states in the U.S.), the road to get where we are has been long and tedious, and there is much work to be done to ensure preparedness for future events."

Resources should not be limiting factors

Massachusetts healthcare providers, like those across the nation, faced a supply crisis that was quick in the making as COVID-19 caseloads surged while the global healthcare supply chain crashed. Healthcare organizations found themselves competing for the same limited resources. But provider organizations put aside competition and began collaborating with each other to share solutions and supplies. Small facilities and independent community hospitals were particularly hard hit and relied on larger organizations and hospital systems for help. Many hospitals relied on outside organizations to identify clinically-acceptable alternatives from legitimate vendors and create third-party stockpiles.

Survey Insight: While most respondents feel their organization's response to the COVID-19 pandemic was effective, 75% of respondents feel resource limitations stand in the way of a successful response to the next public health emergency.

Overreliance on foreign or limited manufacturers creates vulnerability.
While this topic wasn't new to supply chain leaders, a crisis of this magnitude and duration was not something they were likely to anticipate. Although the longstanding practice of product standardization was efficient and made it easier to ensure quality, it left many organizations vulnerable. Simply put, COVID-19 exposed the fragility of the supply chain.

Just-in-time inventory poses challenges in a crisis.
Slim margins mean healthcare organizations have turned to lean or just-in-time inventory to avoid waste and minimize storage costs. Additionally, hospitals are required to have plans for 96 hours worth of supplies on hand for emergencies. Healthcare organizations quickly burned through essential supplies and equipment and couldn't replace them as the pandemic disrupted the supply chain for everything from medication and PPE to medical equipment like beds and ventilators. The sparse availability of this equipment also required providers to closely monitor supply levels and lean heavily on burn rate calculators.

Guidelines and approval for PPE changed frequently.
Organizations' efforts to acquire adequate PPE supplies were complicated by shifting and difficult-to-manage guidelines. Sourcing goods with long lead times became risky because standards could change before the supplies arrived and render them unusable.

Counterfeits and donated supplies can present risks in times of crisis.
Opportunistic new vendors entered the market, hoping to capitalize on the acute needs of healthcare organizations. While many organizations stepped in to successfully donate in-demand supplies, this environment also incentivized the sale of lower-quality and counterfeit products, making it difficult for providers to trust vendors without proper vetting. Donations also posed challenges. Some donations were expired, some were low quality, and others were counterfeit themselves. Channels of usable donations were often short-lived. Community groups and non-healthcare companies, while eager to help in the pandemic's early stages, were understandably unable to maintain that level of support throughout the ongoing crisis.

RECOMMENDATIONS

Develop a statewide emergency supply chain infrastructure.
Healthcare providers, MHA, group purchasing organizations, distributors, manufacturers, and the state government need to collaborate to develop a comprehensive approach to ensuring needed supplies are available during public health crises. Even as the immediate crisis has dissipated, instability remains for healthcare providers in the medical and pharmaceutical supply chain. Relationships with local manufacturers and suppliers should be strengthened to develop more reliable contingency plans that consider a full range of supplies. Challenges to be addressed include: securing funding to build regional stockpiles, establishing a shared statewide warehouse, ensuring an adequate rotation of expiration-sensitive supplies, mitigating an overreliance on single or overseas manufacturers, and alleviating difficulties that small facilities and independent community hospitals experienced accessing critical supplies. The system must provide accurate data on supply chain capacity and stockpile status, and include a centralized vendor verification system that determines the legitimacy of non-traditional vendors.

Ensure the financial stability of healthcare organizations.
Providers incurred billions in financial losses due to service closures and new expenses, such as equipment and staffing. While healthcare organizations must be more proactive by building emergency funds into their individual budgets, government should also anticipate the need for relief dollars in order to ensure the sustainability of the workforce and clinical operations.

Establish new models for purchasing and quality assurance.
Healthcare providers faced price markups and demands by vendors for cash or other upfront payment, which many providers were uncomfortable with and couldn't afford. Much of the government relief funding for supplies was retroactive, so it wasn't available at the point of purchase. To address concerns about the quality of vendors and supplies, MHA created a list of validated vendors. Supply chain leaders offered possible solutions, including an escrow service offering for unvetted vendors and blockchain-enabled vendor identification and product tracking. But a faster, more organized approach is necessary for future emergencies.

Act more nimbly at the federal level.
Despite the massive nationwide supply chain disruption, the federal government was too slow in issuing contracts to increase PPE supplies under the Defense Production Act of 1950. The law should be leveraged more quickly for national public health emergencies. Additionally, federal, state, and local regulations that inhibit the flexible use and storage of supplies should be eased during crises as appropriate.

We are better together

The pandemic, through all its devastation and turmoil, has thrust Massachusetts into the future. And while the crisis is still not over, it has provided the commonwealth with a clear set of critical success factors and pain points that should still demand attention once COVID-19 subsides.

Massachusetts can be better prepared for the next public health emergency if it seizes these lessons and continues to plan and coordinate as one united health system.

This means improving emergency response through further training, investments in data infrastructure, and an increased emphasis on health equity. It will require an expansion of emergency response across the whole continuum of care, including hospitals, public health, behavioral health, and non-acute providers. It will need funding and infrastructure that supports healthcare disaster planning, training, exercises, and response. And it will call for innovative strategies to expand, train, and retain our invaluable healthcare workforce.

These efforts can ultimately create an ecosystem that is more nimble, resilient, and equitable than before. As a nexus of coordination for the healthcare community, the Massachusetts Health & Hospital Association is committed to helping lead this important work – and we know many of our partners are as well.

Massachusetts has been a leader in healthcare because of its drive to honestly assess its weaknesses, leverage its strengths, and push the boundaries of what the nation thinks is possible. There is perhaps no better opportunity to continue that legacy than by embracing what we have learned during the most critical period in the system's history.

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Atrius Health
Baystate Health
Berkshire Health Systems
Beth Israel Deaconess Hospital — Needham
Beth Israel Deaconess Medical Center
Beth Israel Lahey Health
Beverly Hospital
Boston Children's Hospital
Boston Medical Center
Brigham and Women's Hospital
Cambridge Health Alliance
Cape Cod Healthcare
Dana-Farber Cancer Institute
Emerson Hospital
Franciscan Children's
Healthcentric Advisors
Hebrew Rehabilitation Center
Hebrew SeniorLife
Heywood Healthcare
Holyoke Medical Center
Home Care Alliance of Massachusetts
Hospice & Palliative Care Federation of MA
Lawrence General Hospital
LeadingAge Massachusetts
Lowell General Hospital
Martha's Vineyard Hospital
Mass General Brigham
Massachusetts Assisted Living Association
Massachusetts Association of Behavioral Health Systems
Massachusetts General Hospital
Massachusetts Senior Care Association
MetroWest Medical Center
Milford Regional Medical Center
MiraVista Behavioral Health Center
Mount Auburn Hospital
Newton-Wellesley Hospital
Organization of Nurse Leaders — MA, RI, NH, CT & VT
RIZE Massachusetts
Saint Vincent Hospital
Salem Hospital
Shriners Hospitals for Children
Signature Healthcare Brockton
South Shore Health
Southcoast Health
Spaulding Hospital for Continuing Medical Care Cambridge
Spaulding Rehabilitation Network
Sturdy Memorial Hospital
TaraVista Behavioral Health Center
Trinity Health Of New England
Tufts Medical Center
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