Report to the North Carolina General Assembly

Pandemic Health Care Workforce Study

S.L. 2020-3, Sec. 3D.6.

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Pandemic Health Care Workforce Study

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Executive Summary

ABSTRACT

At the direction of the North Carolina General Assembly, the NC Area Health Education Centers (AHEC) program conducted a study of the impact of the COVID-19 pandemic on the health care workforce and health care delivery across the state. Its main goal was to recommend strategies for better addressing the current pandemic and for better preparing for future health crises.

Quantitative results came from 115 leaders of organizations that directly deliver health care services, and qualitative comments came from those respondents as well as another 32 leaders of other organizations that educate, regulate, and support the oversight of health care organizations and the workforce. Survey questions pertained to 15 different areas: workforce pandemic preparedness, workforce surge preparedness, health care workforce training, pre-existing workforce shortages, personal protective equipment (PPE), sufficiency of workforce support mechanisms, impact of postponing nonessential services on the workforce, impact of postponing nonessential services on hospitals, impact of interruptions to routine health care, impact on behavioral health services, quality of telehealth services, impact of telehealth on hospitals, restoring health care delivery, supporting vulnerable populations, and impact on health sciences students. The survey was conducted in October-November 2020, as the COVID-19 pandemic continued to rage across the globe and many providers experienced rising numbers of cases.

Findings, which are organized according to the 15 areas of study, present health care leaders' perspectives on the successes, challenges, and needs that the health care sector faces. As happened with many other issues in many other sectors, the pandemic intensified already existing challenges and health disparities, from health care workforce shortages and a health care delivery infrastructure with limited flexibility to insufficient behavioral health care services and difficulties meeting the needs of vulnerable populations. And an alarming downward spiral highlighted the precariousness of the health care system: There was a chronic health care workforce shortage when the sector experienced an increase in pandemic-related needs and nonessential services were suspended to accommodate surges and safety practices. Organizations then experienced financial losses, requiring them to furlough or terminate staff, which worsened the health care workforce shortage and increased stress on remaining workers.

Recommendations are provided for both actions the State of North Carolina and the health care sector can take to prepare the workforce for a future health crisis as well as topics needing further study. These recommendations address both immediate and long-term concerns and are grouped into five topic areas: staffing, structure, telehealth, behavioral health, and planning for the future.

The breadth of information requested and the timing of the study presented challenges that limited many respondents' participation. With the health care sector busy responding to the pandemic crisis, follow-up studies that dive deeper into key areas and seek input from both organizational leaders and front-line workers will yield vital results. Despite challenges, the study collected substantial and useful insights into the status of North Carolina's health care workforce. Leaders from all major health systems and many key organizations across the state participated in the study and expressed gratitude for the opportunity, and findings are directionally consistent with other information known about the COVID-19 pandemic and the health care sector.

SUMMARY OF RECOMMENDATIONS

I	II	III	IV	V
Staffing	**Structure**	**Telehealth**	**Behavioral Health**	**Planning**
Ensure an adequate health care workforce for current and future health crises.	*Address structural issues that impede the delivery of high-quality health care.*	*Evaluate and strengthen system-wide capacity for telehealth services.*	*Enhance behavioral health services across the health care system.*	*Respond to changing needs and prepare for potential health crises.*
Address immediate workforce needs.	Improve workforce flexibility and support team-based care.	Determine best practices for virtual care.	Expand access to behavioral health (BH) services.	Support protocols to safeguard PPE and other supplies.
Plan for long-term workforce needs.	Assess the impact of delays in care.	Support reforms of payment and reimbursement processes for telehealth.	Integrate BH into primary care and other services.	Address barriers for health science students.
Develop workforce training to care for NC's most vulnerable populations.	Strengthen institutional relationships with health care leaders.	Expand technological capacity and access to virtual care.	Build workforce capacity to deliver high-quality BH care.	Continue to evaluate pandemic challenges and responses.

SUMMARY OF FINDINGS

1. WORKFORCE PANDEMIC PREPAREDNESS

The majority of health care leaders (80%) reported experiencing a workforce shortage, with about half (52%) saying it was worse than before the pandemic. Leaders thought the worst impacted specialty areas were behavioral health care, primary care, general medicine and surgery, and critical care. Top barriers to workforce flexibility were inadequate PPE supply, difficulty onboarding health sciences students, and delays in hiring processes. Leaders believed the most

effective strategies for meeting workforce demands were cross-training workers, floating staff to other departments, offering premium pay, and using supplemental staff (such as travel nurses).

2. WORKFORCE SURGE PREPAREDNESS

As of October-November 2020, about half (52%) the organizations reported experiencing a surge, and 90% of those also reported a workforce shortage. Top barriers for meeting surge staffing demands were employee burnout, staff being quarantined, and inadequate personal protective equipment (PPE). The most reported needs for future crises were supporting PPE manufacturing and distribution, providing support for staff to address personal and family needs, developing employee well-being and resilience programs, and dedicating resources to train staff.

3. HEALTH CARE WORKFORCE TRAINING

Less than half the leaders (40%) believed their workers were sufficiently or very well prepared to respond to the pandemic. COVID-19 testing, patient triage, and caring for self and family were areas of most commonly provided training. Leaders thought the most needed areas of training were COVID-19 testing, caring for self and family, emergency preparedness, and behavioral health care.

4. PRE-EXISTING WORKFORCE SHORTAGES

A majority of respondents (64%) reported that their broader communities were experiencing a health care workforce shortage *prior to* the pandemic. Organizational leaders believed the types of workers in shortest supply both prior to and during the pandemic were nursing assistants (52%), registered nurses (48%), respiratory therapists (47%), and behavioral health counselors (41%). The most common perceptions of *why* community-wide workforce shortages existed were challenges due to geographic location; insufficient wages, incentives, and reimbursement systems; and inadequate qualified workforce supply within the region.

5. PERSONAL PROTECTIVE EQUIPMENT (PPE)

At the beginning of the pandemic, only about half of leaders (53%) felt they had adequate PPE supply. Most had adequate supply by the time of the study (75%). Many respondents mentioned needing easier access to PPE in the future. Most organizations implemented strategies to expand their existing PPE supply including minimizing entry/exit of rooms (81%), rationing N95 masks (78%), reusing N95 masks (69%), and rationing other types of masks (69%).

6. SUFFICIENCY OF SUPPORT MECHANISMS

Leaders thought their workers were most concerned about COVID-19 exposure (92%), personal safety (88%), child care (87%), and preventing burnout (75%). Organizations most often provided counseling services (51%), time off (49%), and resiliency training (38%). About half the respondents reported that their organizations provided few or none of the supports their workers

needed. The top two concerns were childcare and behavioral health, and many leaders noted the need for counseling services for health workers.

7. IMPACT OF POSTPONING NONESSENTIAL SERVICES ON WORKFORCE

Most organizations (71%) temporarily suspended a service or procedure. Most commonly suspended were elective surgeries (65%), outpatient surgeries (62%), radiology imaging (50%), dental procedures (49%), and outpatient rehabilitation services (47%). The most common impacts on the workforce were the reassignment of workers from these areas to other areas or duties, increased stress and uncertainty about their jobs, and concerns about furlough or pay reduction.

8. IMPACT OF POSTPONING NONESSENTIAL SERVICES ON HOSPITALS

Across all types of settings, most organizational leaders (87%) experienced financial losses due to the suspension of service(s). Most shifted to providing some level of telehealth services (72%). About a third of respondents reported furloughing or terminating staff (35%) , and a third reported temporarily closing beds, practices, or offices (32%).

Specific to hospitals, the most commonly reported postponed services were elective surgeries (100%), outpatient surgeries (93%), and outpatient rehabilitation services (86%). Relative to all respondents, hospitals were more likely to furlough or terminate staff (50%), temporarily (50%) or permanently (21%) suspend certain services, and permanently close beds or offices (7%).

Specifically for rural hospitals, the greatest impact was financial losses, with 90% of rural hospital leaders indicating this concern. The second greatest impact was furloughing or terminating staff, which occurred at a far higher rate than that reported by all health care leaders (80% vs. 35%).

9. IMPACT OF INTERRUPTIONS TO ROUTINE HEALTH CARE

Leaders believed the most common areas of care being delayed or omitted by patients were primary care (reported by 61% of leaders), elective surgeries (58%), and vaccinations (52%). With delayed diagnosis and treatment, patients were often in worse health with more severe symptoms when they finally presented for care. Interruptions in routine health care – whether caused by patients hesitant to seek care or by providers suspending services – resulted in financial losses for organizations, which led to the need to reassign, furlough, terminate, or reduce pay for staff.

10. IMPACT ON BEHAVIORAL HEALTH SERVICES

Prior to the COVID-19 pandemic, the demand for behavioral health services already exceeded the health care system's capacity. During the pandemic, most leaders believed demand for behavioral health services increased even more, especially among children and adolescents as well as health care workers and first responders. Most commonly reported needs were care for anxiety, substance abuse or misuse, counseling, and depression. Leaders felt there was inadequate supply of behavioral health care workers and insufficient community resources to help those in need of behavioral health services.

11. QUALITY OF TELEHEALTH SERVICES

Most leaders (78%) reported either expanding existing telehealth services or implementing telehealth for the first time during the COVID-19 pandemic. Most respondents felt that telehealth was effective for delivering routine health care, including behavioral health services, but less effective for delivering emergency health care, behavioral or otherwise. Leaders felt that telehealth best addressed patients' needs for routine/primary care, behavioral health, chronic disease management, minor acute care, and patient education. Challenges included patients' limited access to technology or the internet, and difficulty meeting patients' social and privacy needs.

12. IMPACT OF TELEHEALTH ON HOSPITALS

Hospital leaders valued telehealth during the COVID-19 pandemic because it maintained and expanded their care services; reduced operating costs and PPE usage; and supported workers' schedules, safety, and continued employment. Leaders reported needing additional technology, more staff training, improved reimbursement and payment processes, and uniformity of HIPAA-compliant platforms. Most leaders want telehealth to continue or expand after the pandemic ends.

13. RESTORING HEALTH CARE DELIVERY

Most respondents (68%) had plans to restore services at or above pre-pandemic levels by June 30, 2021. To do so, leaders reported needing additional staff, adequate and reliable PPE, increased public health measures, more physical space, and additional funding support.

14. SUPPORTING VULNERABLE POPULATIONS

Leaders believed that providers are most commonly challenged in caring for people who are homeless, undocumented, incarcerated (or formerly incarcerated), non-English speaking, or have intellectual or developmental disabilities. The pandemic-induced strains on the health care system have only served to exacerbate these pre-existing challenges. And because people from racial and ethnic minority groups are disproportionately affected by these and other social determinants of health, the pandemic has highlighted pre-existing equity issues and health disparities.

15. IMPACT ON CURRENT AND FUTURE HEALTH SCIENCES STUDENTS

Leaders reported that the pandemic had an overall negative impact on students including the interruption of clinical rotations and the delay of course completion, program graduation, or licensure. Clinical experiences were often suspended due to a lack of PPE availability and supervisory capacity – clinical supervisors (i.e., "preceptors") were too busy providing care to patients or too stressed to also mentor students. Leaders reported shifting to virtual learning, engaging students in COVID-19 efforts, offering additional clinical rotations to limit student group sizes, and relaxing hiring and/or licensure requirements. Many leaders were concerned that the pandemic-era reliance on virtual learning will prevent students from acquiring necessary hands-on training to care for patients, and many feared that the pandemic may discourage students from entering the health care field.

Pandemic Health Care Workforce Study

S.L. 2020-3, Sec. 3D.6.

Background

INTRODUCTION

Addressing the needs of the health care workforce has never been more urgent than during the COVID-19 pandemic. Recognizing this, the North Carolina General Assembly directed the NC Area Health Education Centers Program (AHEC) to study the impact of the pandemic on the health care workforce and health care delivery. The study's main goal was to recommend strategies for better addressing the current pandemic and for better preparing for future health crises.

This report completes the AHEC response to Section 3D.6.(c) of S.L. 2020-3, formerly Senate Bill 704 (hereafter "S704"), which requested that the study "focus on the impact of the COVID-19 pandemic, issues that need to be addressed in the aftermath of this pandemic, and plans that should be implemented in the event of a future health crisis." S704 identified 15 areas of study (Appendix D) which can be summarized as follows:

1. Workforce pandemic preparedness
2. Workforce surge preparedness
3. Health care workforce training
4. Pre-existing workforce shortages
5. Personal Protective Equipment (PPE)
6. Sufficiency of support mechanisms
7. Impact of postponing nonessential services on the workforce
8. Impact of postponing nonessential services on hospitals
9. Impact of interruptions to routine health care
10. Impact on behavioral health services
11. Quality of telehealth services
12. Impact of telehealth on hospitals
13. Restoring health care delivery to pre-pandemic levels of care
14. Supporting special populations
15. Impact on current and future health sciences students

This directive was impressively comprehensive, highlighting the General Assembly's desire to understand all facets of the current pandemic as well as their commitment to improving health care services and emergency preparedness for all of North Carolina. In our efforts to capture such a broad range of information on such an ambitious timeline – and while the pandemic continued to strain capacity – our study focused on collecting data from leaders across health care settings, drawing initial conclusions, then identifying areas needing further attention.

As has been the case in other sectors of our society, this crisis has served to highlight and exacerbate preexisting issues and endemic disparities in our health care systems. Many concerns raised by respondents are issues that providers and policy makers have been working to address since long before the pandemic began.

Our collective work to improve health care services and systems in North Carolina is ongoing. The findings of this report illuminate the need for further study of and additional investments in the health care workforce, systems of support, and structures of care delivery.

The State has an essential role to play in coordinating the various policies that are necessary to transform workforce and health care needs during the current COVID-19 pandemic, as well as in future crises.

CONTEXT

As the COVID-19 pandemic has raged across the globe over the past year, providers and policy makers have been inundated with countless reports on the nature of the pandemic in the popular press and professional literature. Though research and recommendations are released *daily* by various sources, it has been difficult to put suggestions into practice as providers and policy makers are overwhelmed by the demands on their time, the sheer volume of information, the difficulty in assessing the quality of the information, and the perpetually shifting nature of the pandemic.

Some threads of insight have so far remained relatively constant over the lifetime of the pandemic and across multiple sources. Experts generally agree that there is a need to avoid overwhelming the capacity of health facilities in order to address provider challenges in caring for both patients with and without COVID-19, to quell unnecessary and avoidable deaths, and to provide and protect health care workers.[1] When providers and facilities become overwhelmed – either due to a surge in patients or to a short supply of qualified workers – the number of preventable deaths rises among both patients with and without COVID-19.[2] There have also been disturbing reports of staff contracting and dying from COVID-19 as well as a surge in staff burnout, distress, and lack of support from their employers.[3] Additionally, the health workforce is aging, and the risk of suffering more severe outcomes, including death, from COVID-19 increases with age.[4]

These factors are prompting concerns about the potential impact to the health care workforce when they are needed most. As has been the case in other sectors of our society, this pandemic has highlighted and exacerbated preexisting issues and endemic disparities in our health care systems. These issues include chronic understaffing, the need for additional workforce training and interprofessional collaborative practice, limited availability of personal protective equipment (PPE), licensure issues, Visa concerns, public health system deficiencies, and more.[5]

LEGISLATIVE MANDATE

In May 2020, the North Carolina General Assembly (NCGA) passed S.L. 2020-3, previously known as Senate Bill 704, to address growing state-wide concerns about the COVID-19 pandemic. Section 3D.6.(c) of S.L. 2020-3 (hereafter "S704") commissioned a *Pandemic Health Care Workforce Study* directing AHEC to "conduct a study of the issues that impact health care delivery and the health care workforce during a pandemic." The provision further required that "the study shall focus on the impact of the COVID-19 pandemic, issues that need to be addressed in the aftermath of this pandemic, and plans that should be implemented in the event of a future health crisis." This study included input from a wide variety of stakeholders, as defined by S704:

- "universities, colleges, and community colleges that educate health care providers;
- health care provider licensing boards;
- the Department of Health and Human Services;
- the Department of Public Safety; and

- geographically disbursed rural and urban hospitals, ambulatory surgical centers, primary care practices, specialty care practices, correctional facilities, group homes, home care agencies, nursing homes, adult care homes, and other residential care facilities."

Soon after, the NC General Assembly's enactment of S.L. 2020-4 directed additional funds to the Campbell University School of Osteopathic Medicine (hereafter, "Campbell"). A provision in S.L. 2020-4 authorized Campbell to expend federal CARES Act funds "for a community- and rural-focused primary care workforce response to COVID-19, including, but not limited to, (i) supporting community testing initiatives, (ii) providing treatment in community-based health care settings, (iii) monitoring rural populations, (iv) educating health professionals on best practices for a pandemic response, and (v) supporting rural communities through primary care."

With this authorization, Campbell dedicated a portion of its funds to support this Pandemic Health Workforce Study. AHEC worked with Campbell to execute a study that met both the requirements of S.L. 2020-3 and S.L. 2020-4. The increased funds from Campbell allowed us to expand our survey sample to health leaders across the state by activating all nine Regional AHECs offices and the Duke AHEC Program.

The full text of Section 3D.6.(c) of S.L. 2020-3 is provided in Appendix D, "S704 Legislation."

METHODOLOGY

The study's Project Team consisted of AHEC representatives and nationally recognized health workforce researchers from the UNC-Chapel Hill School of Nursing. This partnership was made possible by the funding support from Campbell.

The expertise of the Project Team ensured that data collection and study results met the highest standards possible. The study design aimed to capture perspectives from leaders in the various health care settings outlined in S704. To gather data in the most expedient way possible, a survey was used to gather information from organizational leaders (Appendix F).

A detailed description of study methods, including the sample, data collection, and analysis can be found in Appendix E of this report.

OVERVIEW OF THE SAMPLE

Study respondents included leaders from health care organizations that directly deliver health care services as well as those from other organizations that educate, regulate, and support the oversight of health care organizations and the workforce. As shown in Figures 0.1 and 0.2, participants represented several different types of health care settings and were geographically disbursed.

Of 147 total respondents, the largest group was from primary care settings (23%) including primary care practices, Federally Qualified Health Centers, and health departments. Another 14 percent represented ambulatory and specialty care settings (14%). In addition to other health care settings such as long-term care settings (i.e., nursing homes, groups homes, etc.), health systems, hospitals, home care agencies, and correctional facilities, participants also represented educational settings, professional organizations, and regulatory groups.

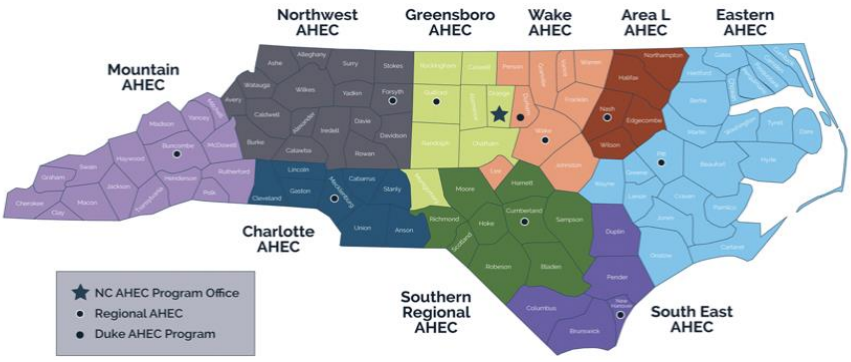
Although "health care systems" were not specified in S704, they were included in the survey to capture the perspectives of this health care setting in the state. Health care systems are comprised of health care organizations providing different levels of services across the health care continuum (e.g., primary, acute, long-term care). In some cases, responses were submitted by leaders from multiple organizations within the same health system.

Figure 0.1. Participating Organizations, by Type (n=147)

Type of Setting	*# of Participants (%)*
Primary Care Settings	34 (23%)
Primary care practice	15 (10%)
Federally Qualified Health Center	8 (5%)
Health Department	11 (8%)
Ambulatory Care Settings	20 (14%)
Ambulatory surgical center	7 (5%)
Specialty care practice	13 (9%)
Acute Care Settings	14 (10%)
Rural hospital	10 (6%)
Urban hospital	4 (3%)
Long-Term Care Settings	17 (12%)
Nursing home	6 (4%)
Adult care home	4 (3%)
Group home	4 (3%)
Other residential care facility	3 (2%)
Health care system	14 (10%)
Home care agency	10 (7%)
Correctional facility	6 (4%)
Health professional organizations	8 (5%)
Health care regulatory groups	6 (4%)
Educational Settings	18 (12%)

It is important to note that this study was conducted in October and November 2020, while organizations were overwhelmed with the COVID-19 pandemic, the duration and intensity of which have been far greater than many anticipated. The demands of pandemic response and patient treatment, combined with the expansive scope and aggressive timeline of this study, prevented some organizational leaders from fully participating.

Figure 0.2. NC AHEC Program, by County



INSIGHTS FROM REGIONAL AHEC OFFICE STAFF

The Project Team met with representatives from the AHEC regional offices weekly to identify and contact stakeholders within their regions, discuss any concerns expressed by organizational leaders, and resolve any barriers to data collection. This ongoing engagement of AHEC offices facilitated data collection and the gathering of timely responses from busy organizational leaders.

CHALLENGES IN DATA COLLECTION

The primary issues that arose related to the breadth of information requested, privacy concerns, and the timing of the study.

AHEC staff indicated that organizational leaders were pleased to be asked to provide important information to the General Assembly but commented on the extent of information being asked of them, remarking on the time it took to assemble and verify data across different departments, facilities, and/or people. Some organizations expressed concerns and distrust about how data would be protected, reported, used, and accessed by researchers and policymakers. Because the

Figure 0.3. Geographic Areas Represented, by AHEC Region (n=115)

AHEC Region	*Counties from Which Organizations Were Recruited*	*# of Participants (%)*
Area L	Edgecombe, Halifax, Nash, Northampton, Wilson	16 (14%)
Eastern	Beaufort, Bertie, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Greene, Hertford, Hyde, Jones, Lenoir, Martin, Onslow, Pamlico, Pasquotank, Perquimans, Pitt, Washington, Wayne	16 (14%)
Mountain AHEC (MAHEC)	Buncombe, Haywood, Henderson, Jackson, Rutherford	16 (14%)
Charlotte	Anson, Cabarrus, Cleveland, Gaston, Lincoln, Mecklenburg, Union	14 (12%)
Southern Regional	Bladen, Cumberland, Harnett, Hoke, Moore, Richmond, Robeson, Sampson, Scotland	14 (12%)
Duke*		12 (10%)
Wake	Durham, Franklin, Granville, Johnston, Lee, Person, Vance, Wake, Warren	9 (8%)
South East	Columbus, Duplin, New Hanover, Pender	8 (7%)
Northwest	Alexander, Alleghany, Ashe, Avery, Burke, Caldwell, Catawba, Davidson, Davie, Forsyth, Iredell, Rowan, Stokes, Surry, Watauga, Wilkes, Yadkin	5 (4%)
Greensboro	Alamance, Caswell, Chatham, Guilford, Montgomery, Orange, Randolph, Rockingham	5 (4%)

**Duke AHEC is affiliated with the Southern Regional AHEC and collaborates with all AHEC centers across the state.*

study was approved by Institutional Review Boards (IRB), we were able to assure them of the confidentiality of their responses.

Nearly all of the AHECs reported that a major challenge in this study was *communication* compounded by *timing*. Most organizational leaders were previously unaware of the pandemic study or the legislation directing it. Overcoming this lack of awareness used valuable time that was needed for participating in the study. Some organizational leaders expressed appreciation and a strong desire to participate in the study but reported being inundated with other priorities as they responded to the ongoing pandemic crisis. Several organizational leaders, especially those in regions of the State that were experiencing surges in COVID-positive cases, expressed being too overwhelmed to take on any additional tasks that were not directly related to their pandemic response efforts. One leader shared, "It is difficult to reflect on the workforce needs for a pandemic while you are still in the middle of a pandemic and can't see an end in sight."

OPPORTUNITIES FOR CONNECTION AND SUPPORT

The data collection process for this study relied on the preexisting relationships that AHEC regional offices had with local organizational leaders. These relationships created opportunities to strengthen the collaborations that are needed to support the State's ongoing pandemic response efforts and to provide exceptional health care to communities across North Carolina.

For example, one AHEC staff member shared, "The unintended successes of this project were the connections [made] during this difficult time and sharing that we and the General Assembly value their work and perspectives regardless of their ability to complete the survey."

The challenges and limitations of conducting a study *about* a pandemic *during* a pandemic provides lessons and opportunities for future studies like this one. Despite such challenges, the study collected substantial and useful insights into the status of North Carolina's health care workforce. Leaders from all major health systems and many other key organizations across the state participated in the study, and our findings are directionally consistent with other information known about the pandemic and the health care sector.

[1] (a) Kenyon, 2020 (b) Fraher et al., 2020 (c) Melillo, 2020 (d) Spetz, 2020
[2] Jacobson, 2020
[3] (a) Artiga et al., 2020 (b) Jewett et al., 2020 (c) Pathman et al., 2021 (d) Norful et al., 2021 (e) Maduke et al., 2021 (f) Reger et al., 2020
[4] (a) Buerhaus et al, 2020 (b) Khera at al., 2020 (c) Shahid et al, 2020
[5] (a) Armstrong et al., 2020 (b) Fraher et al., 2020 (c) Nagesh et al., 2020 (d) Dow et al., 2020 (e) HPNNM, 2010 (f) Gibson et al., 2020 (g) Lai et al., 2020 (h) Spetz, 2020 (i) Mathews & Malik, 2020 (j) Carlin et al., 2021

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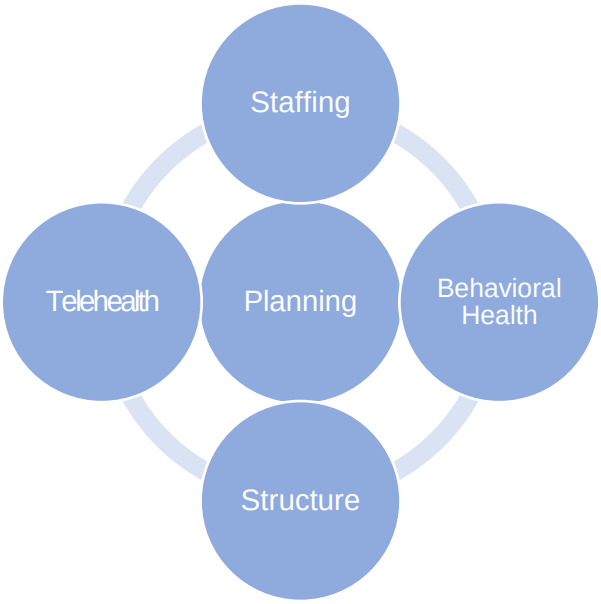
Recommendations

GOALS & RECOMMENDATIONS

By grouping findings into four key areas, AHEC identified overarching goals for North Carolina's health care systems, workers, and patients.

I. **Staffing:** Ensure an adequate health care workforce for current and future crises.
II. **Structure:** Address structural issues that impede the delivery of high-quality health care services.
III. **Telehealth:** Evaluate and strengthen system-wide capacity for telehealth services.
IV. **Behavioral Health:** Enhance behavioral health services across the health care system.
V. **Planning Ahead:** Respond to changing needs and prepare for potential health crises.



Based on our study findings, we offer the following high-level recommendations to the North Carolina General Assembly (NCGA) in these five areas.

GOAL I: STAFFING

To *ensure an adequate health workforce for current and future crises*, North Carolina must address both immediate and long-term workforce needs across the system of care. An effective pandemic response requires a large and adaptable health care workforce to respond to an increase in patients, to address increasingly complex and uncertain patient needs and adjusted workflows, and to provide flexible backup coverage when workers themselves get sick. When organizations enter a pandemic with an existing short supply of health care workers, it is even more difficult to catch up to increased staffing needs and flex to meet different care needs.

RECOMMENDATIONS FOR THE NC GENERAL ASSEMBLY:

A. *Address the State's <u>immediate</u> health workforce needs for the COVID-19 pandemic.* Our results indicate that North Carolina's health workers most urgently need child care assistance[1] as well as behavioral health services such as counseling and wellness care to deal with anxiety, stress, and burnout. Employers are bearing substantial costs to provide the services their employees need. The State should continue to support both employers and employees by investing in community, social, and alternative programs to provide these supports for health care workers.

The most immediate action that can be taken to relieve stress on workers is to bring the COVID-19 pandemic under control. To that end, North Carolina must continue to support ongoing prevention as well as speedy and comprehensive vaccine rollout efforts.

B. *Develop a state-wide plan to address long-term health workforce needs*. Task the AHEC Program with working with key stakeholders to create a long-term plan that aligns the recruitment, retention, training, and deployment of North Carolina's health workforce with the health care needs of North Carolinians. Although this need was described in all settings, study respondents from long-term care and behavioral health were particularly emphatic about the need for intentional workforce planning and support. In combination with other strategies, AHEC can implement the World Health Organization's Health Workforce Estimator (HWFE) tool to formally conduct small scale tests of ongoing workforce needs.

   To address chronic workforce shortages, we need to reconsider our core approach to patient care. Team-based care is a promising solution that also provides better patient outcomes. We must support interprofessional collaboration throughout workers' careers, beginning in school and carrying through to the hospital floor and other care settings. Research has long shown that multidisciplinary care teams with well-defined roles that align with professional skillsets can improve patient outcomes and better use resources. For example, a 2013 article in *Health Affairs*[2] noted:

   > "Team configurations are based on the needs of the patient population and the practice size and type. Primary care teams, for example, can include physicians, nurse practitioners, physician assistants, registered nurses, social workers, dietitians, licensed practical nurses, medical assistants, or community health workers. Effective care involves a team's shared responsibility for a patient, including some role overlap.

   Finally, the state-wide plan should incorporate strategies for increasing racial and ethnic diversity in order to build a health care workforce that reflects the populations of North Carolina's communities. Increasing diversity of the health care workforce is vital to achieving accessible, equitable health care.[3] Bringing about such a change will not occur quickly, and intentional efforts are needed to diversify the health care workforce and address the long-standing inequities and disparities that currently exist in our greater health system.

   Analyzing the potential of such large-scale, system-wide solutions needs more exploration than the scope of this study was able to provide.

C. *Develop health workforce training to improve care for North Carolina's most vulnerable populations*. Health care workers need targeted guidance on how best to care for vulnerable and marginalized populations, both general care and care specific to a pandemic or other health crisis. Training on caring for people who are homeless, undocumented, incarcerated, non-English speaking, or have intellectual or developmental disabilities is most needed.

   Efforts must be made to combat provider bias, stereotyping, and prejudice as well as to overcome minority patients' distrust of the health care system. As COVID-19 disproportionately harms historically marginalized groups,[4] it is critical that leaders take steps

to prepare and support health care workers in responding to the health care needs of the state's most vulnerable populations. Like the nation, North Carolina must devote considerable attention to developing a more coordinated, strategic, and actionable response to address the specific health and social needs of vulnerable populations.

GOAL II: STRUCTURE

To *address structural issues that impede high-quality health care services*, North Carolina must think holistically and creatively. Health providers don't work in a vacuum: They are part of a broader system, and improving the quality of patient care and overall public health depends on better coordination among all the different players within that system. Structural reforms should promote best practices, improve the quality of care, reward innovative models of care, and deliver better health outcomes for all North Carolinians.

RECOMMENDATIONS FOR THE NC GENERAL ASSEMBLY:

A. *Develop a state-wide strategy to improve workforce flexibility and support team-based care.* Dramatic shifts in the health care landscape require responsive shifts in how and where the health care workforce is deployed. A state-wide plan is necessary to increase the health care workforce and improve its flexibility. The plan should further assess the strategies used during the COVID-19 pandemic and identify remaining barriers. Health organizations and systems employed similar strategies in response to pandemic challenges, such as delaying routine health care, cancelling nonessential services, and shifting care to telehealth services. Though this study identified valuable findings on these topics, further research is needed to more deeply evaluate these changes, how they impacted health care workers, and how they impacted short- and long-term patient outcomes.

B. *Assess the impact of delays in seeking or receiving care.* During the pandemic, many patients delayed or avoided seeking health care services for urgent or routine needs. Additionally, many providers delayed or suspended health care services due to limited staff capacity, limited facility space, safety concerns, and other realities of pandemic health care. An evaluation of both clinical and population health outcomes that resulted from such delays is needed to provide crucial insights into preparing for future pandemics. If not already underway across the state, plans to get patients caught up on lapsed care need to be developed and implemented.

C. *Strengthen institutional relationships with health care leaders.* Though it was difficult to collect complete responses for an expansive study at a time when health care organizations were overwhelmed with the pandemic, we found that organizational leaders were highly responsive to survey requests from AHEC because we have established pre-existing relationships. These trusted, local connections substantially improved leaders' willingness and ability to provide the requested information. Future studies and outreach should leverage local and state-wide relationships to the greatest extent possible.

GOAL III: TELEHEALTH

To *evaluate and strengthen system-wide capacity for telehealth services,* we must continue to think creatively and systemically to build on the progress made in response to the COVID-19 pandemic. Virtual care has long been proposed as a solution for improving access to both routine and specialized care for patients across the state. The primary roadblocks have been related to regulations (e.g., HIPAA-related privacy concerns), financing (i.e., Medicare, Medicaid, and private payer reimbursement processes), and technology (e.g., internet access, especially in rural areas). The shifts arising from the COVID-19 pandemic – especially state-wide stay-at-home orders – suddenly opened avenues to telehealth services that had long been closed, and the State, providers, and payers responded quickly. Out of necessity, this new model of care was implemented quickly and without much planning. We should recognize and celebrate the agility of the State, providers, payers, and patients in embracing telehealth. We should also assess the quality, efficiency, and accessibility of the virtual care that has evolved since the pandemic began and ensure that North Carolina leverages the massive advances made in telehealth in such a short time – advances that prove it can be done.

RECOMMENDATIONS FOR THE NC GENERAL ASSEMBLY:

A. *Determine best practices for virtual care.* Telehealth holds great promise for improving the quality and efficiency of non-urgent services, during both normal and crisis conditions. During the COVID-19 pandemic, telehealth was deployed broadly and quickly. A deeper assessment is needed to learn from providers, patients, and other stakeholders about what worked well, what needs improvement, and how best to learn from this experience. In addition to best practices in virtual patient care, the workforce also needs models that describe the roles and responsibilities of various types of health care workers on the interprofessional telehealth team as well as training and support to perform those roles and responsibilities. Virtual care and team-based care are complementary and can be used to more efficiently and effectively deploy resources while improving health access and outcomes for patients.

B. *Support reforms of payment and reimbursement processes for telehealth services.* Build on the work already underway by the State and others to assess how best to pay for telehealth services. Though virtual care promises better resource use and patient outcomes, future State, federal, and private payer reimbursement for telehealth services is uncertain. Study respondents overwhelmingly supported continuing telehealth reimbursements.

C. *Expand technological capacity and access to virtual care,* including the expansion of broadband internet services. North Carolina is fortunate to have a number of world-class health care systems, providers, and facilities, but many services are concentrated in metropolitan areas. Telehealth is an effective and affordable option that allows all of North Carolina's citizens access to high quality health care – as long as they have reliable access to the technology. For different patients, this could mean needing internet access, a cellular device, or training.

GOAL IV: BEHAVIORAL HEALTH

To *enhance behavioral health services across the health care system*, we must prioritize and embrace holistic, system-wide approaches that integrate behavioral health care with other services. In both normal and crisis situations, there is a shortage of health care workers trained in behavioral health, which includes mental health, substance abuse and addiction, and intellectual and developmental disabilities (IDD). Additionally, behavioral health issues often intersect with other challenges relating to social determinants of health, such as homelessness, poverty, and incarceration. Like many other imbalances, the COVID-19 pandemic amplified the gap between the demand for behavioral health care and the availability of behavioral health services. Considering the complexity of behavioral health care challenges, solutions must be comprehensive and integrated across the health care system.

RECOMMENDATIONS FOR THE NC GENERAL ASSEMBLY:

A. *Expand access to behavioral health (BH) services.* North Carolina would benefit from a thorough, broad-scale plan to increase BH services and patients' ability to access them. Increasing insurance coverage, reforming payment and reimbursement processes, growing the health care workforce, improving workforce training, establishing multidisciplinary team-based care, and developing telehealth services are all promising methods for expanding BH services – and are all recommendations listed in other sections of this report. This crossover highlights the interconnectedness of BH care with other health care issues and underscores the need for system-wide solutions.

B. *Integrate behavioral health into primary care and other health care services.* BH care must be integrated into other services provided by the health care system (e.g., primary and specialty care providers, emergency departments), by first responders (e.g., police, EMS), and by community organizations (e.g., counselors, social workers, chaplains). We encourage the General Assembly to build on existing work to address this need. Enhancements should incorporate multidisciplinary team-based care and telehealth services. The state should also provide or enhance existing supports for cross-training, assuring that health care workers are prepared to provide at least basic 911 BH care such as Mental Health First Aid®.[5]

C. *Build health workforce capacity to deliver high-quality behavioral health care.* In our survey, behavioral health counselors and psychologists were among the most commonly reported to be in short supply. The State should confirm these findings and support efforts to increase the number of providers in psychiatric specialty care services such as psychiatrists, psychologists, counselors, and psychiatric-mental health nurse practitioners (PMH-NPs), especially in rural areas. Workforce shortages have led to long wait times between referral and treatment, during which time patients are not receiving needed care and symptoms may escalate.

   North Carolina must enhance professional training for current workers, and curricula for all health professions should integrate the provision of BH care. This includes both basic 911 BH care training as well as interprofessional education on delivering team-based care to BH

patients. Considering BH patients generally have complex concerns that require a coordination of high-quality care across the healthcare continuum, team-based care is the only way to successfully address all of a patient's multiple needs.[6]

And finally, North Carolina must consider the behavioral health needs of health care workers themselves. Stress, anxiety, and burnout were already common issues among workers that only worsened during the COVID-19 pandemic.[7] Addressing the emotional needs of health care workers will improve their individual health and will promote a resilient workforce that is better able to provide health care – behavioral and otherwise – to North Carolina's citizens.

GOAL V: PLANNING AHEAD

To *respond to changing needs and prepare for potential health crises,* continued analysis of both immediate needs and downstream effects is needed. North Carolina must also improve planning efforts to ensure that health systems and others are prepared to respond to a variety of potential crisis scenarios, as the CDC calls "an all-hazards approach to preparedness." Our crisis planning needs to think beyond stockpiling emergency supplies to also considering how we can build a resilient and flexible health care workforce.

RECOMMENDATIONS FOR THE NC GENERAL ASSEMBLY:

A. *Support protocols for PPE and other supplies.* As has been widely reported, health care organizations did not have sufficient stock of items needed to address the COVID-19 pandemic, from personal protective equipment (PPE) to ventilators. Shortages of PPE such as masks and gowns placed health care workers at higher risk of contagion, endangering both their own lives and the lives of the patients relying on their care. Dovetailing with chronic staffing shortages, these supply shortages quickly caused systemic challenges and widespread delays in care.

   Specifically for PPE, the General Assembly should work with stakeholders to ensure the supply chain of PPE, both the adequate production as well as smooth distribution in a variety of settings across the health care sector. Additionally, if it does not already exist, a process is needed to assess PPE readiness across health care settings to understand, develop, and share best practices around PPE use and appropriate reuse in a variety of potential scenarios.

   Further, it is important to remember that PPE and ventilators were in short supply in *this* particular crisis, but it might be something different that is desperately needed next time. The General Assembly should consider multiple potential scenarios and ensure that the supplies that would be needed in various health crises are available.

B. *Address barriers for health sciences students*. Task the AHEC Program with working with educational institutions, health care organizations, and other key stakeholders to jointly develop a plan to ensure health sciences students are able to complete required clinical rotations and other necessary training. During the COVID-19 pandemic, student safety concerns (e.g., inadequate PPE) and reduced bandwidth of clinical supervisors and preceptors (e.g., due to

heightened stress, increased patient care responsibilities, and postponed patient care) meant that many health sciences students were unable to complete required clinical rotations. Considering chronic, pre-existing health workforce shortages, North Carolina cannot afford interruptions to the professional pipeline of new health care workers.

In addition to educators and health organizations working together to ensure adequate opportunities for on-site clinical training, interprofessional education must be incorporated into academic settings. Team-based care is essential to the future of health care, and incoming health care workers should be prepared to practice collaboratively. A foundation in interprofessional and multidisciplinary care will be crucial for everyday care as well as for a nimble response to a health crisis. Health professions schools should follow national guidance to longitudinally incorporate interprofessional competencies across curricula. Schools should collaborate both internally across professions and externally across institutions to develop interprofessional experiences for trainees, and those experiences should be supported in the clinical learning environment. To accomplish this, faculty need support both to create integrative interprofessional classroom experiences and to work with health systems and practices to cultivate effective interprofessional clinical experiences.

C. *Continue to evaluate pandemic challenges and responses*. This study captures just one moment in a lengthy, evolving crisis. As the nature of the pandemic shifts, so do needs and potential solutions. The stakeholders interviewed for this study consistently adapted to the challenges they were facing as quickly and effectively as they were able. A system for implementing rapid-cycle studies – to share strategies, learn from each other, and circulate successful solutions – should be implemented to assist stakeholders in a timely response in the future.

   Further, the wide breadth and aggressive timeline of this study would have made it difficult for health care leaders to provide complete answers in the best of times; during a lengthy pandemic, leaders had even less time to respond fully. Yet, the surveys and interviews provided vital insights into the current health care landscape and allowed valuable conclusions to be drawn regarding immediate and long-term needs. Subsequent studies are needed to take a deeper dive into each of the key areas, examining the extent to which issues raised in this report have been addressed and identifying new issues needing attention.

   Finally, this information about health care *workers* came secondhand from health care *leaders*. A study of front-line workers to follow up on key issues raised in this report will be crucial for making progress in our collective goal to address the needs of North Carolina's health care workforce and, ultimately, improve the health outcomes of all North Carolinians.

[1] Pathman, 2021
[2] Dower C. et al, 2013
[3] (a) McGee & Fraher, 2012 (b) Richman, Spero, & Fraher, 2016 (c) Stanford, 2020 (d) IOM, 2003
[4] Lopez et al., 2021
[5] MHFA, 2019
[6] HPNNM, 2010
[7] (a) Batra, 2020 (b) Ehrlich et al., 2020 (c) Sahebi et al., 2021

Pandemic Health Care Workforce Study

S.L. 2020-3, Sec. 3D.6.

Findings

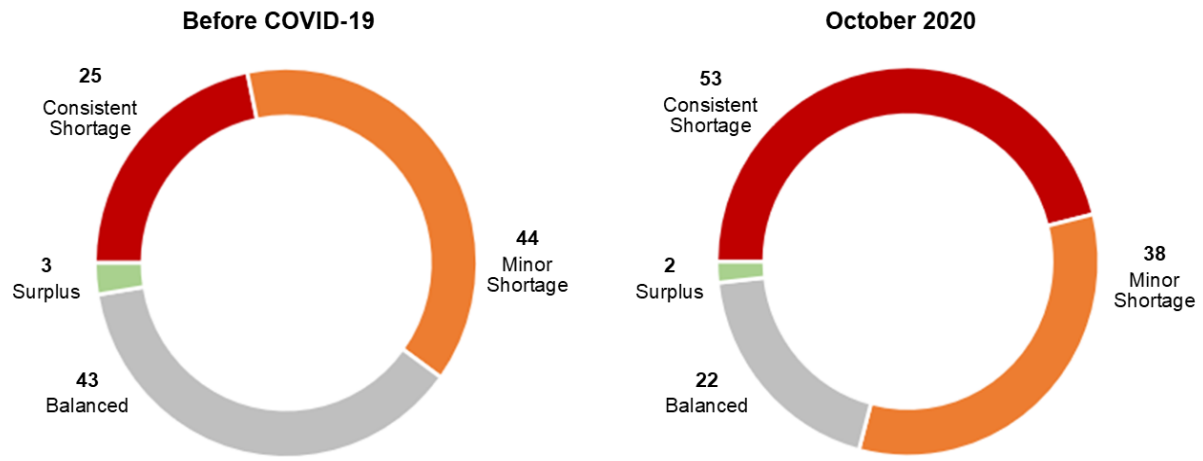
This section presents findings of the *Pandemic Health Care Workforce Study* organized according to the 15 issue areas specified in S704.

1. WORKFORCE PANDEMIC PREPAREDNESS

Section 3D.6.(c). (1) *Adequacy of the health care workforce supply to respond to a pandemic in the following settings: acute care, ambulatory, primary care, nursing homes, adult care homes, other residential care facilities, correctional facilities, and in-home care.*

At the start of the COVID-19 pandemic, nearly two thirds of the 115 organizational leaders in health care settings described having either a minor shortage (38%) or a consistent shortage (22%) of health care workers before the pandemic. **However, at the time of the study in October and November 2020, leaders reported that the shortage had considerably worsened, with about 80 percent of organizations reporting either a minor shortage (33%) or a consistent shortage of workers (46%)**. More than half the organizations (52%) reported that their workforce supply was worse than before the pandemic (Figure 1.1).

Figure 1.1. Leaders' Perceptions of Shortages of Health Care Workers



Leaders were also asked about their internal supply of different **types of workers** at the beginning of the COVID-19 pandemic and at the time of the survey. The *most common* type of workers in short supply at both the start of the pandemic and in October-November 2020 were **nursing assistants** (52%), **registered nurses** (48%), **respiratory therapists** (47%), and **psychologists and behavioral health counselors** (41%) (Appendix B, Table 1.1).

Finally, leaders were asked about their internal workforce supply by **clinical specialty area**, again at the beginning of the COVID-19 pandemic and in October-November 2020. Prior to the pandemic, leaders most commonly reported a workforce shortage in **general medicine and surgery** (63%), **critical care** (56%), **behavioral health care and psychiatry** (52%), and **emergency care** (50%). As of October-November 2020 – once the pandemic was well underway

– leaders felt the shortages remained in the same areas but at slightly higher levels (respectively: 63%, 66%, 62%, and 63%) (Appendix B, Table 1.2).

Figure 1.2. Leaders' Perceptions of Shortages of Health Care Workforce Supply *within Organizations*, by Role Category

Role Category	*Shortage at pandemic start*	*Shortage in Oct-Nov 2020*	*Not in short supply*
Nurses and Nursing Groups	52%	57%	36%
Ancillary Staff	25%	34%	62%
Physicians	33%	28%	63%
Allied Health	24%	27%	69%
Advanced Practice Providers	26%	22%	72%

See additional data in Appendix B, Table 1.1.

WORKFORCE FLEXIBILITY

In a crisis situation such as the surge of COVID-19 patients, it is important to have the ability to redirect the existing workforce supply to meet staffing demands. Organizational leaders were asked to rate the effectiveness of various measures for responding to workforce demands during the pandemic (Figure 1.3 and Appendix B, Table 1.3). The most effective strategies – those reported as "very effective" or "moderately effective" – were:

- cross-training workers to practice in specialties and departments outside their usual areas;
- floating staff to other units and departments outside of their home units;
- offering premium pay; and
- using supplemental staff, either internally (such as per diem staff) or externally (such as locum tenens physicians or travel nurses).

Figure 1.3. Effectiveness of Measures Taken to Bolster Workforce Supply in Response to COVID-19

Strategies	*# using this strategy*	*Very or Moderately effective*
Cross-training health care workers to practice in specialties/ departments outside their "home" work unit (n=105)	71	69%
Floating staff to other units and departments (n=105)	78	67%
Premium pay for overtime, working extended shifts, or hazard (n=110)	65	63%
External supplemental staffing, such as locum tenens or travel nurses (n=108)	58	62%
Internal supplemental staffing, such as per diem staff (n=108)	60	62%
Changes to speed up hiring and onboarding processes (n=107)	70	51%
Implementing new or enhancing employee wellness and resilience programs (n=105)	65	43%
Closing beds (n=104)	35	46%
Diverting patients to other organizations (n=103)	36	42%

BARRIERS TO MEETING WORKFORCE NEEDS

Leaders were asked to rate the extent to which a variety of barriers affected their organization's ability to readily deploy existing health care workers to needed areas during the pandemic (Figure 1.4). The top barriers (those ranked a "severe" or "moderate" barrier) in redirecting staff to meet COVID-19 staffing demands included:

- inadequate PPE supply;
- difficulty onboarding health sciences students; and
- delays in hiring processes and other human resources issues.

Figure 1.4. Barriers to Redirecting Health Care Workers during COVID-19

Barriers	*# reporting this as a barrier*	*% reporting as Severe or Moderate barrier*
Inadequate PPE supply (n=107)	86	45%
Difficulties onboarding health sciences students (n=105)	46	33%
Delays in hiring processes and other HR issues (n=104)	61	31%
Hiring and onboarding newly graduated or licensed health professionals (n=105)	59	25%
Inadequately trained staff in areas of need (n=105)	43	23%
Restrictive position descriptions, job responsibilities, etc. (n=106)	46	17%
Meeting licensure requirements for physicians, advanced practice providers, and other health professionals (n=104)	48	13%
Onboarding inactive professionals to return to practice (n=105)	25	12%

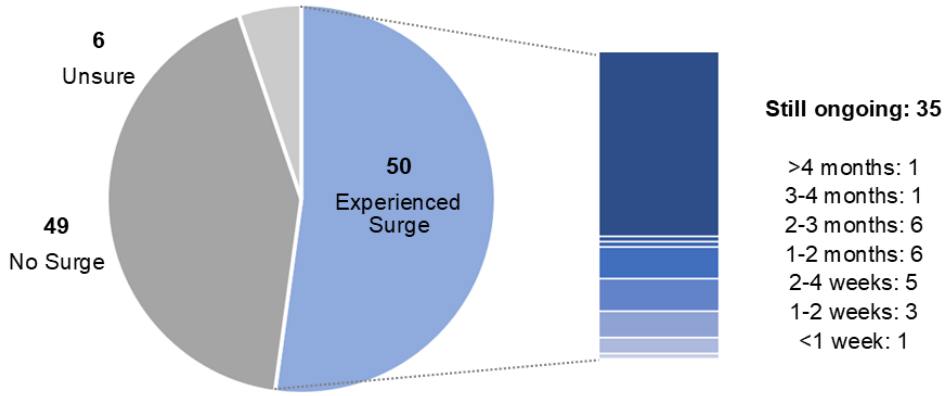
2. WORKFORCE SURGE PREPAREDNESS

Section 3D.6.(c). (2) *Adequacy of the health care workforce supply to address the COVID-19 surge; the ability to redirect the existing workforce supply to meet staffing demands, including the identification of any barriers; and recommendations to eliminate barriers and readily deploy staffing in a future health crisis.*

For the purposes of this study, "surge" was defined as a significant increase in the number of COVID-19 patients requiring care within a short period of time that stressed normal health care organizational operations.

In October-November 2020, over half of all surveyed organizational leaders (52%) reported that their organizations had experienced a surge. And over half of these leaders (58%) reported that the surge was still ongoing. At the time of our study, half of the organizational leaders (48%) reported that their organizations either had not experienced a pandemic-related surge or they were unaware if their organization had experienced a surge (Figure 2.1 and Appendix B, Table 2.1).

Figure 2.1. Organizational Experiences with a COVID-19 Surge



Less than a quarter of the organizations experiencing a surge (23%) had shifted to a crisis staffing plan to address an *existing* staffing shortage that affected the provision of care. Many organizations (40%) had implemented a contingency staffing plan to prepare for *anticipated* staffing shortages. About a third of the leaders (38%) reported that their organization had not shifted away from their usual staffing plan. **Nearly all who had experienced a surge (90%) also reported a shortage of health care workers.**

Specifically with regards to issues during a surge, leaders were asked to identify whether the following items were barriers in meeting *surge staffing demands* (Figure 2.2). By far the most common barriers were **employee burnout** (reported by 76% of respondents) and **staff in quarantine for COVID-19** (72%). Other moderately common barriers were inadequate PPE (43%), testing delays for staff clearance to return to work (41%) and challenges with cross-training staff (40%).

Figure 2.2. Barriers to Meeting Surge Staffing Demands

Barriers (n=58)	*% reporting this as a barrier*
Employee burnout	76%
Staff testing positive or in quarantine for COVID-19	72%
Inadequate PPE	43%
Testing delays for staff clearance to work	41%
Challenges with cross-training staff	40%
Reassignment of high-risk staff or staff with high-risk family member	29%
Lack of staff in telehealth or virtual care delivery	26%
Hiring freezes or HR delays	24%
Lack of staff trained in critical care or caring for ventilator patients	19%
Inadequate funding to support needed resources	7%

STRATEGIES FOR ELIMINATING BARRIERS

Leaders were asked to rate the helpfulness of the following strategies in eliminating barriers to readily deploy staff in a future pandemic or health crisis (Figure 2.3). The strategies that were most frequently reported as very or moderately helpful were:

- supporting PPE manufacturing and distribution;
- providing supports for staff to address personal and family needs;
- developing employee well-being and resilience programs; and
- dedicating resources to train staff.

It is worth noting that these responses came from organizational leaders, and a survey of front-line health care workers might yield different results in terms of which strategies employees found to be most helpful.

Figure 2.3. Strategies Needed to More Readily Address Surge

Strategies	*Very or Moderately Helpful*
Supporting PPE manufacturing and distribution (n=102)	90%
Supports for personal and family needs (n=102)	88%
Employee well-being and resilience programs (n=97)	82%
Dedicating resources to train staff (n=76)	72%
More flexible practice regulations (n=76)	68%
Reduce state-to-state practice requirements (n=78)	68%
Developing plans to rapidly engage students (n=86)	67%
Responsibly lift travel bans (n=69)	54%
Relax visa limitations (n=66)	45%

3. HEALTH CARE WORKFORCE TRAINING

Section 3D.6.(c). (3) *Adequacy of the health care workforce training, by setting, and the need for additional training or cross-training of health care providers.*

In October-November 2020, less than half of organizational leaders reported that their health care workers had adequate training to respond to a pandemic or similar health crisis prior to the COVID-19 pandemic, with only 14 percent reporting workers were “very well prepared” and 26 percent reporting workers were “sufficiently trained.” The most common response was that workers were only “somewhat trained” (42%), and more than one in six leaders reported that workers were “inadequately trained” (18%) to respond to the pandemic (Figure 3.1).

Organizational leaders were also asked to report on the cross-training provided to their health care workers during the pandemic and to identify other areas of training needed to prepare for future

health crises (Figure 3.2). There were consistent responses for these two questions, with COVID screening and testing as well as self-care and wellness appearing high in both lists.

During the COVID-19 pandemic, the most common areas of cross-training provided were:

- screening and testing procedures for COVID-19 in existing or potential patients;
- patient triage; and
- self-care, personal wellness, and care of family.

Leaders further reported that in order to prepare for future health crises, their workers most needed additional training in:

- screening and testing procedures for COVID-19 in existing or potential patients;
- self-care, personal wellness, and care of family;
- emergency preparedness; and
- behavioral health access and treatment.

Chart 3.1. Leaders' Perceptions of Workers' Preparedness for Responding to the COVID-19 Pandemic

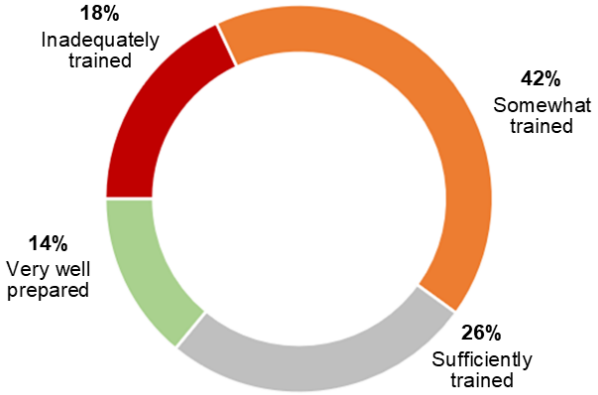


Figure 3.2. Workforce Training during the COVID-19 Pandemic and in the Future

Area of Training	*Offered during COVID-19 Pandemic (n=109)*	*Needed for Future Preparation (n=104)*
Screening and Testing Procedures for COVID-19 in Existing or Potential Patients	60%	72%
Self-Care, Personal Wellness, and Care of Family	38%	64%
Emergency Preparedness	31%	61%
Behavioral Health Access and Treatment	21%	46%
Patient Triage	42%	44%
Public Health Care	18%	44%
Managing Patients with Respiratory Diagnosis and Developing a Treatment Plan	28%	42%
Chronic Conditions	25%	36%
Palliative Care or Grief Counseling	10%	35%
Providing Care to Patients in Critical Care	13%	27%
Managing the Care of Ventilator Patients	15%	26%
General Medical/Surgical Care	19%	25%

4. PRE-EXISTING WORKFORCE SHORTAGES

Section 3D.6.(c). (4) *Impact of the COVID-19 pandemic on communities with preexisting workforce shortages.*

Leaders were asked if their geographic area – not necessarily their own organization – already had pre-existing shortages of health care workers before COVID-19 (Appendix B, Table 4.1). Nearly two thirds of respondents (64%) believed that their broader communities were indeed dealing with a health care workforce shortage *prior* to the pandemic, with the most common types of pre-existing health worker **shortages** among **nursing assistants** (74%), **registered nurses** (70%), and **psychologists and behavioral health counselors** (72%).

At the time of the study in October-November 2020 – once the pandemic was well under way – leaders reported the most common worker shortages across the community as those same four types at close to the same levels (67%, 72%, 72%, and 74% respectively).

It should be noted that leaders' perceptions of shortages in the community (as described in this section) were generally worse than their perceptions of shortages within their own organizations (as described in section 1). It is unclear how accurate these perceptions are or what may be contributing to such a gap.

A substantial increase in the shortage of respiratory therapists was a notable outlier, with 50% of leaders retroactively reporting a shortage *within their organizations* at the start of the pandemic and 63% in October-November 2020. A similar jump was noted in leaders' perceptions of the shortage of respiratory therapists *in the community*, from 56% to 74%. A shortage of this particular role makes sense in the context of the specific mechanisms of the COVID-19 virus. A future pandemic or other health crisis may see a shortage in a different role, depending on the needs of those patients.

Additionally, we asked leaders for their perspectives as to *why* they believed the health care workforce shortage existed in their communities. The top three responses were:

- challenges due to geographic location, especially in rural areas;
- low wages, incentives, and reimbursement systems that challenge workforce supply; and
- an inadequate qualified workforce supply within their region or the State.

For example, in describing how geographic location affected workforce shortages, participants shared the following:

- "This is a small area and the majority of workers are in larger surrounding areas."
- "[There is] competition with larger communities paying more."
- "Rural area, lack of community resources, too few clinicians covering too many patients leading to burnout and impacting quality of care and follow-up received."

Participants further described issues affecting workforce supply:

- "The supply of nurses, specifically, cannot reach the demand for nurses on an annual basis due to turnover caused by burnout. Nurses are tired of working with shortages, especially in hospitals, so they are finding alternative places to work."
- "Fewer individuals are choosing service work, wages are low, and the work is challenging physically, emotionally, and financially."

Others commented on the quantity and qualifications of pre-licensure education students, noting the limited number of graduates compared to the number needed across the health care sector.

5. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Section 3D.6.(c). (5) *Impact of personal protective equipment (PPE) availability on the health care workforce, by setting.*

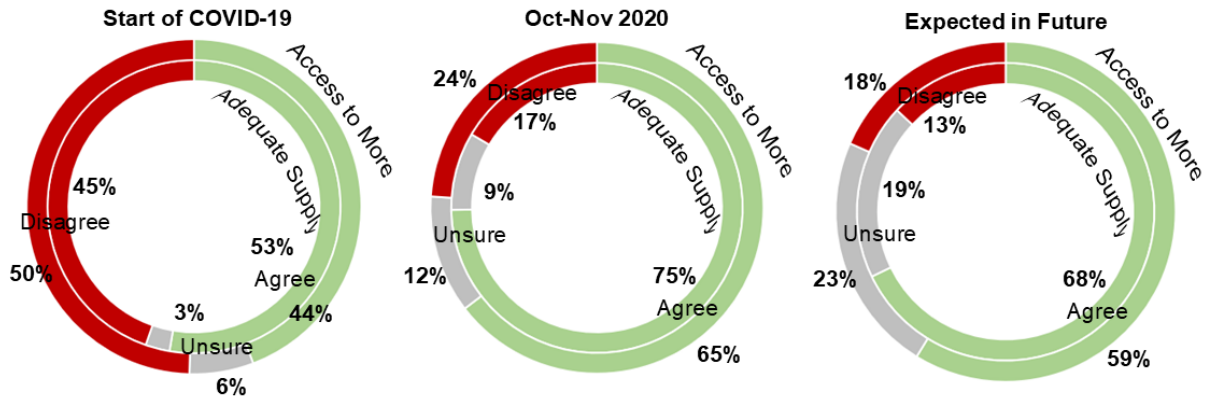
Organizational leaders were asked about the supply of PPE equipment including N95 respirators, gloves, gowns, and face shields. Respondents were asked if they agreed or disagreed with the following statements:

- "Our organization had **an adequate supply** of appropriate PPE for our health care workers."
- "Our organization had adequate, rapid **access to additional PPE** for our health care workers."

Additionally, they were asked to consider those statements by different time periods: at the start of the COVID-19 pandemic, at the time of the study in October-November 2020, and their expectation for the future (Figure 5.1 and Appendix B, Table 5.1).

Reflecting back on the beginning of the pandemic, only about half of the respondents felt they had adequate PPE supply (53%) and easy access to additional PPE (44%). By the time of the survey, most respondents agreed they had adequate PPE supply (75%) and access to additional PPE (65%).

Figure 5.1. Supply of and Access to PPE



Looking to the future, many respondents anticipated having an adequate PPE supply (68%) and access to additional PPE (59%). However, many leaders were worried about future supply or potential supply chain issues in the event of another crisis. Some mentioned needing better access to PPE. For example, one respondent noted that they needed "easier access for companies to acquire PPE" because it was a "time intensive process" when PPE was in short supply.

Figure 5.2. Strategies Used to Expand PPE Supply

Strategy	*Yes*
Minimize Enter/Exit of Rooms (n=111)	81%
Ration N95 Masks (n=111)	78%
Reuse N95 Masks (n=111)	69%
Ration of Other Masks (n=111)	69%
Ration of Gowns (n=109)	54%
Ration Eye Shields (n=111)	54%
Reuse of Gowns (n=108)	35%
Adding Negative Pressure Rooms (n=105)	28%

We also asked organizational leaders about the strategies implemented to expand limited PPE supply during the COVID-19 pandemic (Figure 5.2). Most of the leaders reported that their organizations **rationed N95 masks** (78%) and other masks (69%), and many reported they even **reused N95 masks** (69%). A large majority of leaders reported that their organizations implemented strategies to **minimize entry into and exit out of patient rooms** (81%).

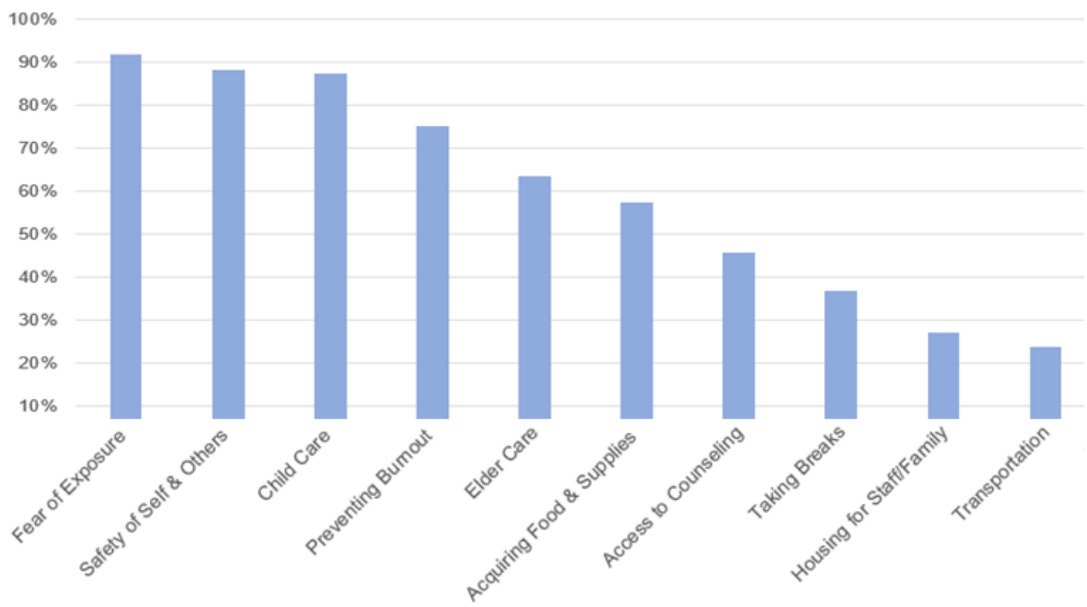
6. SUFFICIENCY OF SUPPORT MECHANISMS

Section 3D.6.(c). (6) *Sufficiency of support mechanisms for the health care workforce, including the availability of child care, transportation, mental health and resilience support services, and other support items.*

We first asked organizational leaders to rate the extent to which their workers expressed various concerns (Figure 6.1 and Appendix B, Table 6.1). The vast majority of participants reported that health care workers were very or moderately concerned about **fears of exposing themselves, other staff, family, and friends** (92%), about **personal safety and the safety of other staff, family, and friends** (88%), **child care** (87%), and **preventing burnout** (75%). Other relatively common concerns were about providing elder care (63%) and acquiring food and supplies (57%).

It should be noted that these concerns were reported by organizational leaders on behalf of their workers; soliciting responses directly from health care workers may yield different results. However, these insights from leaders do track with concerns reported across the field.[1]

Figure 6.1. Staff Concerns during the COVID-19 Pandemic



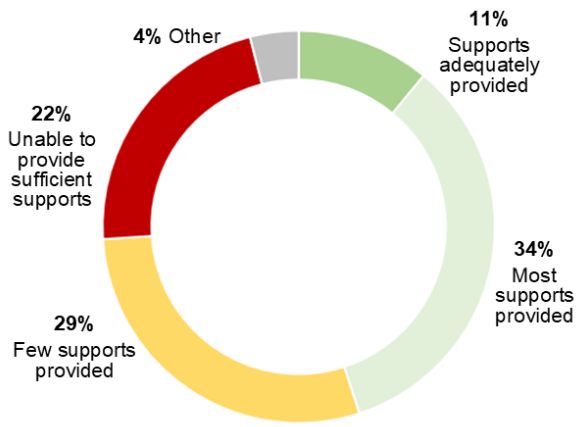
Leaders were then asked what support services their organizations provided and what support services their workers used (Appendix B, Table 6.2)

- The most frequently reported support services *provided by organizations* were **counseling services** (51%), **adequate time off** (49%), and **resiliency training** (38%).
- The most frequently reported support services *used by health care workers* were **child care** (41%), **counseling services** (36%), and **adequate time off** (36%).
- Generally speaking, support services for **child care** (41%), **elder care** (23%), and **transportation** (13%) were used by health care workers but NOT provided by their organization.

Additionally, organizational leaders were asked about the *sufficiency* of the support services provided relative to the needs of their workers during the pandemic.

About half the surveyed leaders (51%) felt that their organizations provided **few support services** or were **unable to sufficiently provide the services** needed to address the concerns of their workers (Figure 6.2).

Figure 6.2. Sufficiency of Support Services (n=108)



Finally, health care leaders were asked to describe additional supports needed to better meet the needs of their health care workforce in a future health crisis. **Childcare** was re-emphasized in these responses, with one organizational leader saying that "childcare was [the] biggest issue." Other commonly indicated areas of support needed were **behavioral health services**, **financial support**, and **more staff** (Appendix B, Table 6.3).

7. IMPACT OF POSTPONING NONESSENTIAL SERVICES ON WORKFORCE

Section 3D.6.(c). (7) *Impact of postponing or eliminating nonessential services and procedures on the health care workforce.*

Overall, the majority of respondents (71%) reported that their **organizations temporarily postponed or eliminated the provision of a service or procedure due to COVID-19**. And of hospitals and health care systems, their leaders *all* reported that their organizations temporarily postponed or eliminated the provision of nonessential health care services. Although few in number, leaders from long-term and personal care settings reported the fewest service interruptions (Figure 7.1).

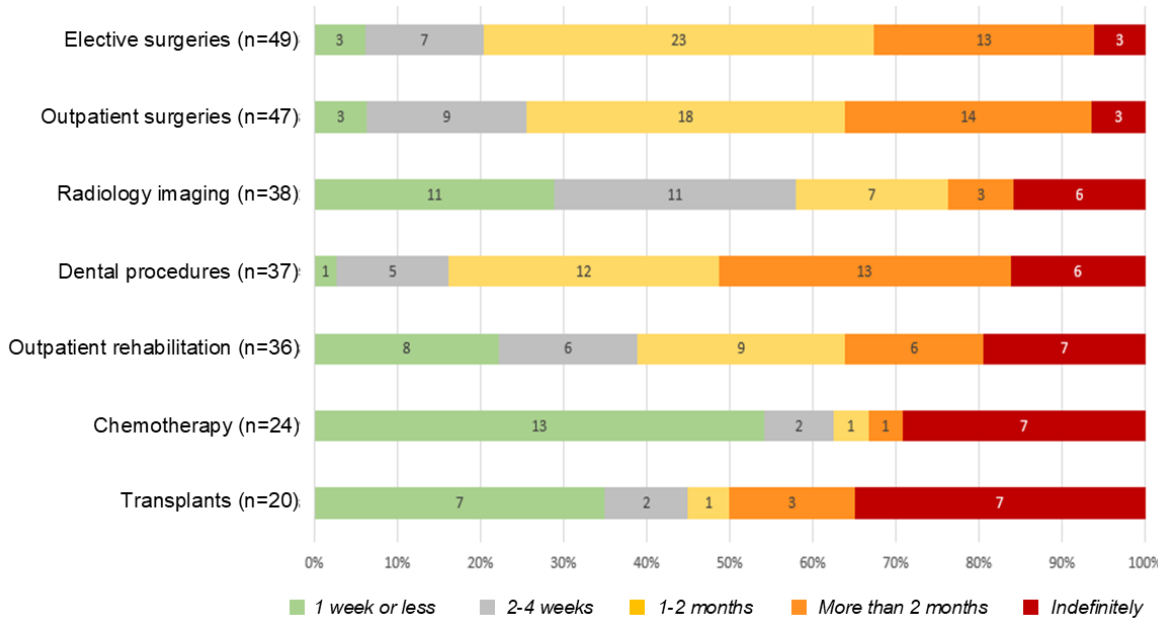
Figure 7.1. Organizations Postponing or Eliminating Nonessential Health Care Services

Type of Setting	*n (%)*
Overall	76 (71%)
Hospitals (n=14)	14 (100%)
Ambulatory care (n=19)	13 (68%)
Health system (n=13)	13 (100%)
Primary care (n=33)	22 (67%)
Long term/personal care (n=14)	6 (43%)
Home care agency (n=9)	5 (56%)
Correctional facility (n=5)	3 (60%)

Of the 76 leaders whose organizations postponed or eliminated services, we asked which types of services were most often impacted (Figure 7.1 and Appendix B, Table 7.1). **Elective surgeries** (65%) were most often postponed or eliminated, followed by **outpatient surgeries** (62%), **radiology imaging** (50%), **dental procedures** (49%), and **outpatient rehabilitation services** (47%). Others included outpatient services, annual physical exams, speech therapy, physical therapy, and occupational therapy.

The duration of service suspension for each organization varied, ranging from less than one week to indefinitely (Figure 7.1). A suspension period lasting from one to two months was the most common for elective surgeries (47%), outpatient surgeries (38%), and outpatient rehabilitation services (25%). For chemotherapy and transplant services, a suspension period lasting less than a week was most frequently reported (54% and 36% respectively), but an indefinite suspension period was also reported for these services (29% and 35% respectively).

Figure 7.1. Duration of service cancellation due to COVID-19, by service type (all settings)



IMPACTS OF SERVICE CANCELLATION ON HEALTH CARE WORKFORCE

Leaders were asked how the suspension of nonessential services and procedures affected the organization's health care workforce. Of the 72 respondents, few leaders reported that there was no impact of service suspension on the health care workforce. Most organizational leaders reported that employees working in areas where services were suspended were **redeployed or reallocated to other areas** of the organization. Leaders indicated that most workers from areas where services had been suspended were reassigned duties to help the organization address the COVID-19 response. For example:

- "Most of the workers who were in areas where services were suspended were reassigned to COVID-19 response."
- "Workforce staff assigned to areas that experienced interruption or suspension of procedures were offered cross training, pandemic pay, and the ability to cover entrances for employee and visitor screening. Surgical and procedural staff were able to work in acute care settings with cross training."

Some organizational leaders indicated that their employees felt **stress and uncertainty** about working in new settings of care and in new roles. For example:

- "Many health care workers felt undervalued and concerned about their future employment."
- "Some [workers] were able to shift their roles to meet the current COVID demand needs, but now that we have shifted back, it has created additional burden and stress."

Finally, many organizational leaders described their financial concerns, stating that they had to **furlough staff** or **reduce pay** to balance their reduced visit volume and revenues. For example:

- "As our visit volume decreased, we had to furlough staff… to balance our reduced revenue."
- "Nursing workforce was furloughed. No physicians or advanced practice providers were..."
- "Furloughed workers went several months at 20% pay, enough to retain benefits."
- "We took a PPP [Paycheck Protection Program] loan [from the Small Business Administration] and paid employees fully during the pandemic, with the exception of great reduction in doctor's pay."

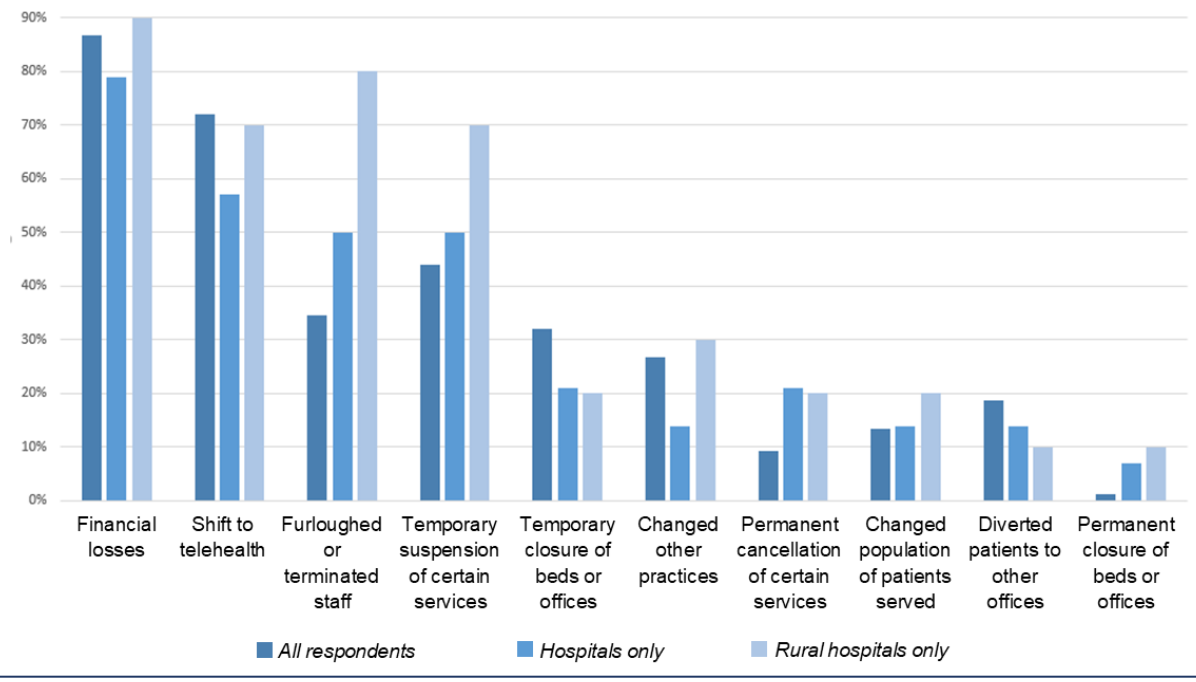
8. IMPACT OF POSTPONING NONESSENTIAL SERVICES ON HOSPITALS

Section 3D.6.(c). (8) *Impact of postponing or eliminating nonessential services and procedures on hospitals, particularly rural hospitals.*

IMPACTS ACROSS ALL ORGANIZATION TYPES

The majority of organizational leaders (87%) across all types of settings reported experiencing **financial losses** due to the suspension or elimination of nonessential services during the COVID-19 pandemic. Most leaders (72%) also reported **shifting to telehealth** or virtual care, and nearly half (44%) reported **temporarily suspending programs or services**. During the pandemic,

Figure 8.1 Impact Service Delays on Health Care Organizations, by Setting



organizations also reported **furloughing or terminating staff** (35%); **temporarily closing beds, practices, or offices** (32%); and **changing other organizational practices** such as introducing social distancing guidelines, curbside care service, virtual care service, and decreased patient volumes (27%). (See Figure 8.1 and Appendix B, Table 8.1).

IMPACTS SPECIFIC TO HOSPITALS

Of the 14 hospital leaders, all reported **postponing elective surgeries** (100%) and nearly all reported postponing **outpatient surgeries** (93%), **outpatient rehabilitation services** (86%), and **radiology imaging** (79%).

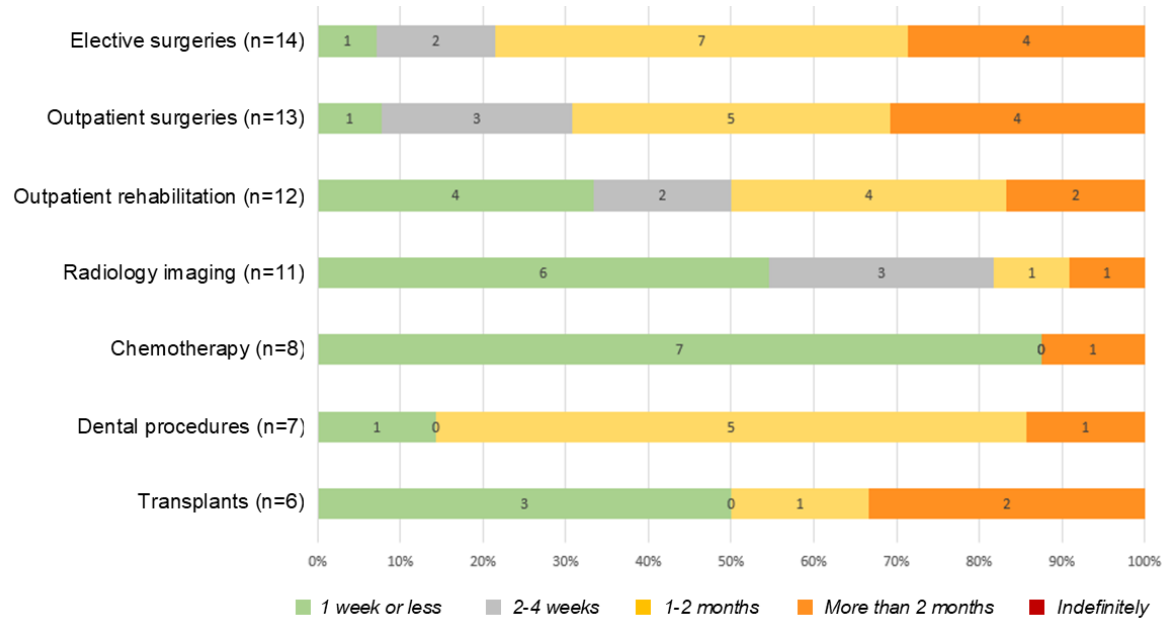
Of those procedures delayed in hospital settings, **the longest delays** – procedures postponed one month or longer – were in **dental procedures** (86%), **elective surgeries** (79%), **outpatient surgeries** (69%), transplants (50%), and outpatient rehabilitation services (50%) (Figure 8.2).

Similar to all settings, the most commonly reported impact of service suspension in *hospitals* was **financial losses** (79%). Other common impacts included a shift to telehealth or virtual care delivery (57%), furloughing or terminating staff (50%), and temporarily suspending certain programs or services (50%).

Relative to all respondents, *hospitals* (acute care settings) were more likely to furlough or terminate staff (50%); temporarily (50%) or permanently (21%) suspend certain services; and permanently close beds, practices, or offices (7%).

This disparate impact was even more pronounced in *rural hospitals* (Appendix B, Table 8.1). Leaders from all 10 rural hospitals reported that nonessential services were postponed or eliminated (100%). About 90% of leaders reported that their organizations suspended outpatient

Figure 8.2. Duration of service interruption due to COVID-19, by service type (hospital settings only)



surgeries, radiology imaging, and outpatient rehabilitation services. **The greatest impact reported on rural hospitals was financial losses**, with 90% of rural hospital leaders indicating this concern. The second greatest impact reported by rural hospital leaders was **furloughing or terminating staff**, which occurred at a far higher percentage than that reported by all health care organizational leaders (80% vs. 35%).

9. IMPACT OF INTERRUPTIONS TO ROUTINE HEALTH CARE

Section 3D.6.(c). (9) *Interruptions in the delivery of routine health care during the COVID-19 pandemic and the impact to citizens, primary and specialty care practices, and the health care workforce employed in these practices.*

Organizational leaders were asked to describe the health care services they observed people in their communities delaying, overlooking, or omit seeking altogether during the COVID-19 pandemic. The most common areas that leaders believed were being delayed or omitted by patients were **primary care** (reported by 61% of leaders), **elective surgeries** (58%), and **vaccinations** (52%) (Figure 9.1).

Figure 9.1. Services delayed or omitted by patients

Service area	*% of leaders*
Primary care	61%
Elective surgeries	58%
Vaccinations	52%
Care for chronic conditions (e.g., Diabetes, Hypertension)	48%
Well child visits	47%
Dental care	41%
Behavioral health services	37%
Recommended or needed surgeries	27%
Urgent care	19%
Care for cardiovascular symptoms (e.g., Chest pain)	19%
Cancer diagnosis and care	19%
Care for stroke-like symptoms	18%
Prenatal/maternity care	16%

A total of 24 organizational leaders from primary care practices, specialty care practices, and other health care delivery settings provided more detailed observations about the impact of interruptions in the delivery of routine health care during the COVID-19 pandemic on their communities, practices, and healthcare workforce. Organizational leaders reported that **people delayed care/treatment or missed the proper timing of diagnosis**. This meant that patients were often in much worse health with more severe symptoms when they finally presented for care. Some respondents offered telehealth/virtual care, but there were some cases where patients refused to receive care via these services. For example, participants shared:

- "Interruptions to the delivery of certain services and the apprehension of patients wanting to come in for routine care during the height of the pandemic made it challenging to ensure patients were following up with treatment for chronic health conditions. The implementation of telehealth services has been incredible but is not a service that all patients/communities have access to."

- "We saw an increase in the number of ED visits and hospitalizations as patients avoided PCP offices and urgent care due to fear of contracting COVID. We also saw a delay in on-boarding patients to home health services as patients are required to either see their physician for a face-to-face visit or complete an audio-visual visit which is challenging in a rural area with lack of access to wi-fi and/or cellular data."

- "We continue to see patients presenting to the ED with hypoxia [low blood oxygen], COVID positive, who delayed care until they were very sick."

Some organizational leaders additionally described the impact of interruptions in the delivery of routine healthcare on their health care workers. In general, as patient visit volume decreased, organizational leaders had to redeploy staff to other areas in their network or furlough staff to balance their reduced revenue. For example,

- "Due to our patients refusing telehealth and/or [in-person] visits, we had to furlough our staff and providers. We were concerned on how and if we would survive through this. The not knowing is always stressful when you have other lives that you are supporting."

The following table summarizes the impact of interruptions in the delivery of routine healthcare on patients, workers, and health care organizations (Figure 9.2).

Table 9.2. Summary of impact of the COVID-19 pandemic on routine health care

Impact on Patients & Community	*Impact on the Health Care Workforce*	*Impact on Health Care Organizations*
• Fear of the unknown • Challenges to keep scheduled visits and appointments • Patients refusing telehealth • Worsening health status • Progression of disease	• Furloughed staff • Redeployed staff to areas outside of their typical work unit • Increased staff fatigue, stress, and burnout	• Delayed care, procedures, diagnosis • Shifting care to telehealth, especially behavioral health services and primary care services • Financial losses, primarily due to delays in routine care

10. IMPACT ON BEHAVIORAL HEALTH SERVICES

Section 3D.6.(c). (10) *Impact of the COVID-19 pandemic on the delivery of behavioral health services.*

"Behavioral health" is an umbrella term that includes mental health, substance use and addiction, and intellectual and developmental disabilities (IDD). Leaders provided a detailed assessment of how the demand for behavioral health services affected their organizations and their communities. Of the 127 organizational leaders that responded, most reported that the demand for behavioral health services had **increased** in their community during the pandemic. Leaders reported that the

behavioral health services needed in communities during the pandemic were care for **anxiety**, followed by **substance abuse or misuse**, **counseling**, and **depression**.

Children and adolescents were reported to be in great need of behavioral health services. North Carolina's health care providers recognized the same pattern seen nationally: School closures and distancing mandates have increased stress and anxiety particularly among children and adolescents, who are in developmental stages that require significant social interaction.

Additionally, the need for behavioral health services for **health care workers** and **first responders** was frequently reported.

DECREASED ACCESS TO BEHAVIORAL HEALTH SERVICES

Some leaders described how an **inadequate supply of behavioral health care workers** and **insufficient community resources –** such as broadband service needed to receive telehealth care – reduced individuals' access to behavioral health services. With both increased need and reduced access to outpatient care, many organizations saw a rise in Emergency Department (ED) admissions for behavioral health needs. Leaders reported that EDs in particular experienced a substantial increase in psychiatric crisis admissions and that these patients were being held longer in EDs due to a lack of inpatient psychiatric beds. These factors combined to create additional strain on ED capacity and staff.

In addition to BH *access*, many respondents (37%) stated that the pandemic negatively affected the *delivery* of behavioral health services to patients and health care workers in their organizations. Though the demand for behavioral health services increased during the pandemic, leaders noted a variety of barriers including:

- insufficient supply of behavioral health workers;
- delays in admissions to inpatient facilities or group homes due to inadequate COVID-19 testing;
- reduced numbers of inpatient and group home beds due to social distancing standards;
- patients' personal decisions to delay seeking care;
- lack of accessibility to telehealth services;
- less effective care due to requirements for PPE usage, social distancing, and plexiglass barriers, in turn, limiting the development of interpersonal relationships between patient and provider ; and
- limited group therapy sizes due to social distancing requirements.

INCREASED TELEHEALTH SERVICES FOR BEHAVIORAL HEALTH NEEDS

Many leaders indicated that their organizations implemented or increased the use of virtual care (i.e., telehealth or phone use) to deliver behavioral health services to their patients during the COVID-19 pandemic. Respondents reported that telehealth **increased access to care for patients by offering remote appointments** when in-person visits were restricted. However, other leaders indicated that telehealth also **limited access for individuals without a computer, cell phone, or**

sufficient internet service. Some leaders also noted the challenges associated with providing high quality of care using telehealth, especially for providing group therapy, substance withdrawal counseling, and health care for children and adolescents. Finally, leaders reported that **insufficient Medicaid reimbursement rates for telehealth services severely limited their ability to deliver behavioral health care**. These challenges will be discussed in further detail in the next section.

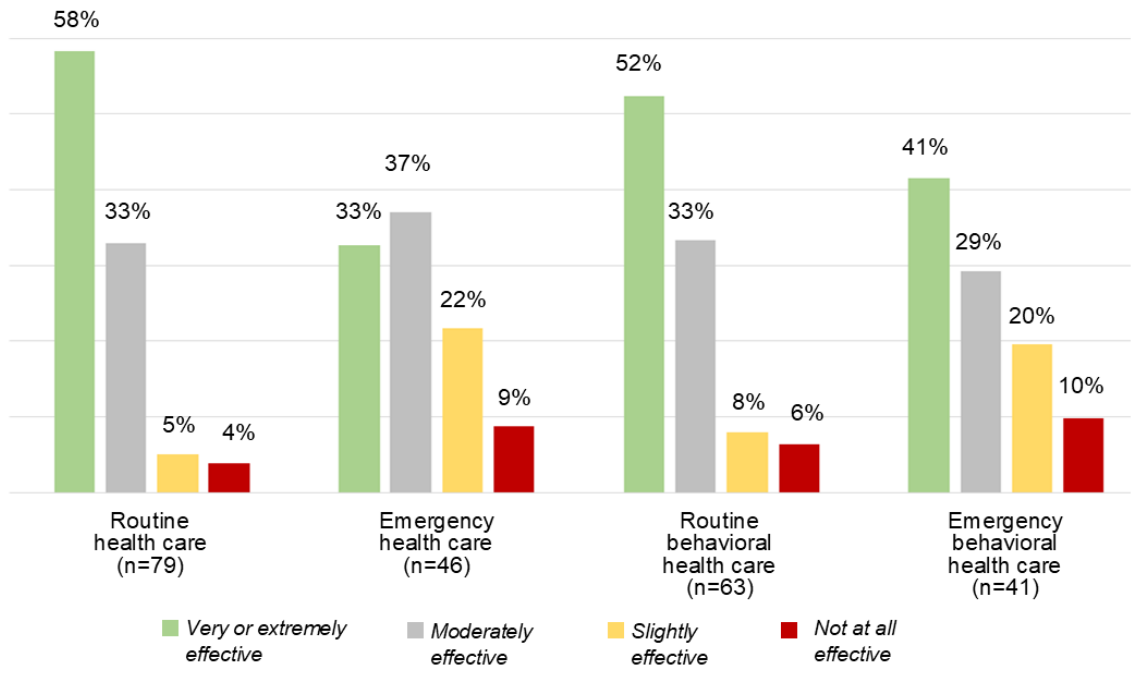
11. QUALITY OF TELEHEALTH SERVICES

Section 3D.6.(c). (11) *Ability of telehealth options to deliver routine and emergent health and behavioral health services to patients.*

The majority of respondents (78%) reported either expanding existing telehealth services or implementing the use of telehealth for the first time during the COVID-19 pandemic.

Organizational leaders shared their perspectives on the effectiveness of different telehealth options to deliver routine and emergency health services. More than half of those whose organizations provided such services found telehealth to be "very or extremely effective" for delivering **routine health care** (58%) and **routine behavioral health care** (52%) services. Fewer leaders reported that telehealth was "very or extremely effective" for **emergency health care** (33%) and **emergency behavioral health care services** (41%) (Figure 11.1 and Appendix B, Table 11.1).

Figure 11.1 Effectiveness of Telehealth Options by Service Area



Overall, organizational leaders reported that the **primary benefit of telehealth was that it maintained or improved patients' access to care while also maintaining patient safety.** For example, respondents stated:

- "Telehealth can additionally resolve patient transportation issues, is more convenient, reduces time, and could potentially decrease safety risks for high-risk patients (i.e., falls)."
- "[Telehealth] provided assurance to patients that they could be seen safely."

Leaders felt that telehealth best addressed patients' needs for **routine/primary care**, **behavioral health, chronic disease management**, **minor acute care**, and **patient education**. One leader suggested that telehealth might also increase patient compliance with plans of care since it may allow for easier patient follow-up. Specifically, several leaders indicated that telehealth was an effective option for remote monitoring (e.g., of heart implant devices), medication management, triage or pre-screening, and specialty care.

CHALLENGES AND LIMITATIONS OF TELEHEALTH

The most common challenges that organizational leaders reported about telehealth were related to **technology or internet accessibility** and the additional effort required for health care workers to troubleshoot problems. For example, participants stated:

- "Technology is not effective for all patients. The elderly [are] challenged with use of software, smartphones, and/or computers. Wi-fi is also not readily available in rural areas."
- "The time spent trying to get the telehealth to work properly on the patients. It takes two to three calls to actually prepare and provide the telehealth visit. Either the patient is not ready and no matter how many times you give them instructions to get ready for the visit they are never ready, do not answer or left their medication in the other room."
- "Equipment malfunctions or replacements could not totally be addressed via telehealth since ventilators require a physical presence of the [Respiratory Care Practitioner] to solve the issue."

Leaders also described challenges with telehealth being inadequate for meeting **patients' social and privacy needs**. For example, participants stated:

- "If the resident is able to get out then the trip to the doctor is good for them. It is not so much the appointment itself but the whole experience. They get to go for the drive, breath in the fresh air, go to a different environment."
- "Those who are in domestic violence situations don't have the privacy they need at home to address their concerns with their provider."

Overall, leaders reported that telehealth was least helpful for physical exams; providing emergency care; performing surgical, laboratory, or radiology procedures; and meeting complex care needs.

12. IMPACT OF TELEHEALTH ON HOSPITALS

Section 3D.6.(c). (12) *Impact of telehealth on hospitals during the COVID-19 pandemic.*

Leaders across all types of settings[2] described several positive and negative impacts of telehealth on their organizations and health care workers (Figure 12.1 and Appendix B, Table 12.1). Overall, leaders valued telehealth during the COVID-19 pandemic because it **maintained and expanded their care services**; **reduced operating costs and PPE usage**; and **supported workers' schedules, safety, and continued employment**.

However, rapidly expanding telehealth infrastructure while simultaneously managing added pressure from the pandemic also increased workloads and stress on both individual workers and organizations as a whole. Leaders described a number of challenges throughout their telehealth implementation process, such as managing security concerns, revenue losses, and care delivery requirements, all while coping with limited resources and a sense of urgency.

Figure 12.1. Impacts of Telehealth on Health Care Organizations and Workers

Benefits of Telehealth	Challenges of Telehealth
• Maintain and expand health care services • Reduced operating costs • Conservation of PPE • Retention of health care workers • New, supportive scheduling options for workers • Decreased safety risks for workers	• Sense of urgency amid limited resources • Security concerns • Revenue losses • Need for workforce training • Inconsistent care delivery requirements • Increased workload for health care workers • Stress and burnout of health care workers

To implement or expand telehealth services in response to the pandemic, organizational leaders generally described the need to **purchase or upgrade hardware and software** and to **train or hire additional staff in telehealth usage**. The difficulty with training workers is further compounded by a general lack of existing best practices or defined professional roles in virtual health care.

A few leaders also reported **requirements to quickly credential health care providers in telehealth** and **address malpractice concerns** during the pandemic. For example, leaders from organizations using telehealth for the first time offered the following remarks:

- "[We] assessed which clinical services and public health programs could use a telehealth platform, contracted with a new vendor, [and then] trained staff."
- "We conducted a thorough assessment of our electronic medical record, trained staff on its use, assessed the billing regulations governing the provision of telehealth services, implemented the services after acquiring the needed telehealth equipment for staff and will

continue to use this service line post COVID. Telehealth visits are now 28% of our organization's total visits."

Some leaders described how the **payment and reimbursement processes for telehealth led to revenue losses**. For example:

- "As a Hospital Based Clinic/Provider Based Clinic, we lost revenue because the nurses were no longer involved in the provision of care."

TELEHEALTH RECOMMENDATIONS FROM LEADERS

Organizational leaders were asked to identify recommendations related to telehealth usage for delivering health care services. Several respondents described wanting **telehealth delivery options to *continue or expand*** even after the pandemic is over. A few leaders explained:

- "Telehealth as a mode of delivering healthcare services should be expanded and refined and should remain an option for care for patients who are able to participate. Payers should recognize this as a value-added service and should continue providing reimbursement for telehealth services as we move forward."
- "Expand the use of telehealth to address staffing shortages and address disparities in staffing coverage."
- "Telehealth is a critical tool for us to connect providers and patients remotely and ensure access to care… We think this should continue for routine, urgent care, and follow-up visits to reduce patients' need to come into the office."
- "Mental health parity for telehealth services is CRITICAL and should be indefinite!"
- "I would like to see [telehealth] available for all hospitalized clients in a manner where they could see and visit with family. This is especially true in LTC [Long Term Care], rehab and other situations where people cannot visit and families cannot stay informed of what is happening."
- "Ideally the benefits (including some of the flexibility with requirements) will continue even after COVID-19 response ends."

Although many organizational leaders wanted telehealth options to continue, many also recognized the need for **formal telehealth training** for health care workers, **uniformity of HIPAA-compliant telehealth platforms**, and **fair reimbursement rates for telehealth**. For example, respondents stated:

- "We need major training in this area."
- "Specific HIPAA-compliant platforms are needed that are streamlined and uniform. Learning each provider's unique system is highly problematic."

- "Reimbursement for telehealth services should be equitable and fair…"

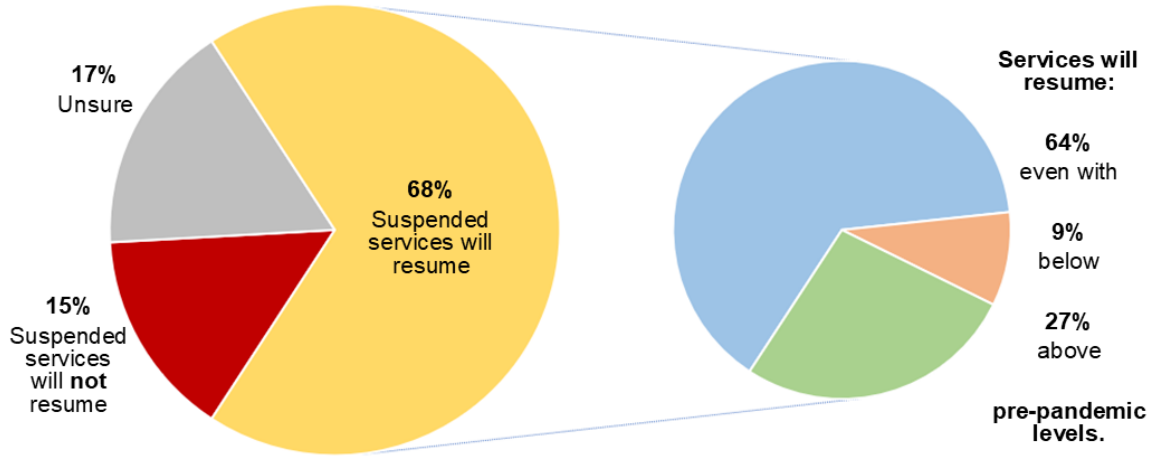
Despite the challenges related to providing telehealth services, most providers and organizations thought the benefits were strong enough to at least preserve the option of telehealth as North Carolina moves beyond the pandemic.

13. RESTORING HEALTH CARE DELIVERY

Section 3D.6.(c). (13) *Support necessary to resume health care delivery to pre-pandemic levels.*

Most organizational leaders (71%) reported that their organizations temporarily postponed or eliminated the provision of nonessential health care services and procedures for their patients due to COVID-19. Of those, **more than half (68%) reported planning to resume services by June 30, 2021**. Further, they generally assumed that services would resume to pre-pandemic levels or higher (Figure 13.1 and Appendix B, Table 13.1).

Figure 13.1. Expectations for Resuming Suspended Services by June 30, 2021



Leaders also described the supports their organizations needed to resume the delivery of suspended healthcare services to pre-pandemic levels. The majority of participants reported needing **additional health care workers** to resume services. Some leaders stated:

- "Extra staffing to support screening/testing procedures."
- "We would need additional staffing and we would need to operate our clinics [with] longer hours. Given the requirements of masking, disinfecting, and social distancing, we do not have the throughput that we might have had prior to COVID. To reach pre-pandemic levels, we would have to be open longer to serve the same number of people (as we cannot see the same number of people at one time)."

Many leaders also indicated the need for **adequate and reliable PPE** and for **increased public health measures** (e.g., vaccines, contact tracing, public education, and more testing). Several others described the need for **additional physical space** to see patients or to allow them to wait in their cars in support of distancing requirements. For example, respondents stated:

- "We will continue to need access to clinical supplies such as PPE, available clinical staff such as primary care providers, dentists, and other clinical staff."
- "[We would need] PPE and the ability for patients to wait outside of our facility (in cars) if distancing is still necessary."
- "[We need an] alternate care delivery site away from non-patients under investigation."

Many leaders described the need for **funding support**. For example, respondents stated:

- "[We need] funding to survive the loss of income from closed or reduced services."
- "[We need] funding to support providers who have been adversely impacted as well as flexibility to provide services in different ways."
- "Many facilities and organizations are going to require ongoing financial assistance to maintain current levels of staffing and continue services, even beyond 2021."

Finally, several participants described the need for **changes in care financing or healthcare delivery in North Carolina**. For example, participants stated:

- "This is a great opportunity to expand health coverage to more North Carolinians. This would increase opportunity to access healthcare and allow services to return to pre-pandemic levels."
- "Money was flowing to do COVID testing, identify cases…when COVID fades, [we] will be left with people with [high blood pressure] [and] metabolic symptoms but [the] supports to resume [services] could have been helped through this period of time…wish we knew how we could pivot/advance health care delivery services to areas that have always had large gaps for certain populations…squandered [patient] trust that we will have to earn back. Let's not go back to where we were; let's advance from there to something better."

14. SUPPORTING VULNERABLE POPULATIONS

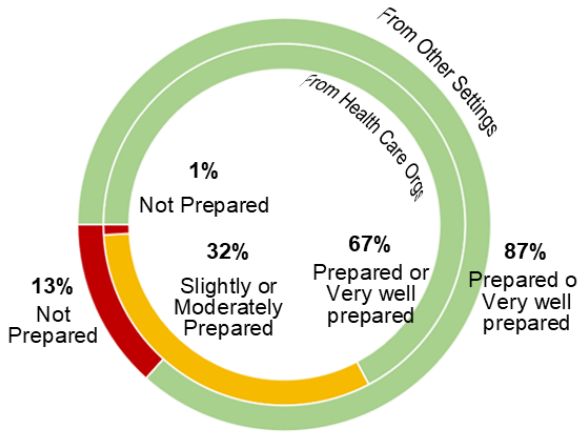
Section 3D.6.(c). (14) *Ability of the health care workforce and health care delivery structure to respond to the needs of minority populations, individuals with health disparities, and individuals and communities with increased health risks, during a pandemic.*

Minority groups, people subject to health disparities, and people with increased health risks were defined in this study as "vulnerable populations." These vulnerable populations also represent those at greatest risk for exposure to COVID-19, comorbid or subsequent illness, and limited access to health care. These barriers are often associated with the *social determinants of health (SDOH)* such as age, race, ethnicity, income, employment status, living arrangements, or other personal characteristics.

Most leaders gave their **organizations high ratings for the *overall preparedness* of the workforce to respond to the health care needs of vulnerable populations during a crisis or pandemic**.

In addition to overall preparedness, leaders gave their health care **workers high ratings for their *abilities* to respond to the needs of vulnerable populations**.

Figure 14.1. Leaders' perceptions on health care workers' preparedness to meet needs of vulnerable populations



In addressing specific types of vulnerable populations, the most common challenges reported across the system were in the ability to respond to the health care needs of people who are **homeless**, **undocumented**, **incarcerated** (or formerly incarcerated), **non-English speaking**, or have **intellectual or developmental disabilities** (Appendix B, Table 14.2). In general, leaders reported feeling that their health care workforce was prepared to address the needs of Black or African-Americans, Hispanic or Latinx people, older adults, children, low-income people, and uninsured or underinsured people.

It is important to note that the survey asked leaders their opinions on the workforce's ability to meet the *health care needs* of these populations. Respondents did not describe the needs of vulnerable populations extending beyond those that health care providers can directly address, such as homelessness, poverty, lack of health insurance, and other concerns that are related to the social determinants of health.

Several leaders described initiatives such as staff diversity training and education, community outreach programs for diverse groups, and organizational partnerships to reach underserved communities. However, responses generally lacked specificity, were inconsistent in how vulnerable populations were defined, and failed to address structural and social reasons for health disparities.

For example, when leaders were asked what steps their organizations took to prepare health care workers to meet the needs of vulnerable populations during COVID-19, nearly a third of leaders responded, "not applicable," "don't know," "treat everyone the same," or "already caring for these populations."

15. IMPACT ON CURRENT AND FUTURE HEALTH SCIENCES STUDENTS

Section 3D.6.(c). (15) *Impact of the COVID-19 pandemic, including concerns surrounding PPE availability, on current health sciences students and implications for future students contemplating a career in health sciences.*

IMPACT ON CURRENT STUDENTS

Organizational leaders provided insights on the impacts of COVID-19 on current health sciences students. Nearly all 107 leaders from both health care delivery and other settings indicated that the pandemic had an **overall negative impact on students**. By far, the most frequently reported negative impacts were concerns about the **interruption or suspension of clinical rotations** and **the delay of course completion**, **program graduation**, or **licensure.**

Reasons as to why clinical experiences were suspended or canceled were largely related to a lack of **PPE availability** and the **lack of availability of clinical supervisors** (i.e., "preceptors") because they were too busy or stressed to mentor students. For example:

- "Operating and cultivating a learning environment is resource intensive and expensive. Although it is an important part of many organizations, it is not mission critical & can be a distraction during a high-intensity COVID environment."
- "We have delayed preceptor opportunities. We have also curtailed internships, so the ability to gain practical experience is hindered."

Many leaders are concerned that the pandemic-era reliance on virtual learning for clinical experiences will prevent students from acquiring **necessary hands-on training to care for patients**. Additionally, some leaders reported that students themselves have expressed concerns about being **unprepared to enter the workforce**. Leaders' remarks include:

- "The pandemic has negatively impacted learners. Their ability to have live clinical experiences instead of simulated ones will impact their growth and development in the health care workforce."
- "…Lots of virtual learning with simulation, but that is not sufficient. Class sessions are mostly on zoom, and zoom fatigue and burnout are high."
- "...The transition from student to worker during pandemic is extremely challenging and I fear they have lost a lot of the basic knowledge because they have had to get up to speed so quickly on COVID. Especially concerned with the [lack of exposure to] teamwork and resident interaction training/experiences that are so critical, I fear the new students will return us to a more institutional model we have fought years to get away from."

One leader summarized the negative impacts, stating:

> "Students were significantly impacted by COVID-19. As most clinical experiences were cancelled or delayed, students were impacted in many ways including uncertainty of meeting requirements or attaining graduation; worry of having knowledge gaps with missed experiences, changing protocols, [and] various rules and regulations across different settings; eligibility for exams or licensure; and PPE availability."

Conversely, leaders also described **positive impacts** of the pandemic on current health science students, such as the **valuable learning opportunity** and an **increased interest in health care and public health**. For example:

- "They have had to see and experience first-hand how to deal with a pandemic."
- "In many ways I think it has sparked additional interest in health and public health...."

SUPPORTING HEALTH SCIENCES STUDENTS

Most respondents indicated that their organizations did not introduce any innovations to address barriers in accepting and/or supporting health care pre-professional students in their clinical experiences and training. Those who did report changes primarily described the shift to **virtual learning platforms.**

Several leaders reported engaging health science students to support COVID-19 efforts, including **training students to pre-screen patients**, **allowing students to shadow licensed providers in telehealth**, and **supporting quality control.** For example:

Some organizational leaders reported **offering additional clinical rotations to limit student group sizes** or **relaxing hiring and/or licensure requirements**.

One leader described how **developing a taskforce and collaborating with other organizations** proved to be beneficial:

> "We developed a system-wide Student Re-Entry taskforce that… worked to identify both barriers and solutions to return students. This included running scenarios for PPE use; identifying high-risk experiences where we would not place students…; [and] creating [memoranda of understanding] with academic partners about COVID measures and screening guidelines, standard education for all students including PPE protocol, and a graduated schedule of return to clinicals. We also worked with various partners to develop other strategies for remote experiences including research and telehealth."

IMPLICATIONS FOR FUTURE HEALTH SCIENCES STUDENTS

Most leaders (64%) reported that the pandemic **negatively impacted future students**. These leaders most often cited **concerns that future students would be more likely to reconsider a health sciences career**. For example:

- "...some may steer away from pursuing a career in healthcare in light of the COVID pandemic for fear of being on the frontlines and experiencing the emotional stress and burnout associated when future epidemics/pandemics arise."

- "Many are scared, or their parents are…. They are overstressed."

- "I'm sure nursing students are skeptical because they've seen how taxing it is to provide care for COVID-19 patients, and they don't want to contract the virus themselves. Long hours, influx of patients/increased census for an extended period of time, death and dying, scared of spreading the virus to family/loved ones, etc. are reasons in my view nurses wouldn't want to go to into the healthcare field."

Whether or not enrollment and entrance numbers actually decline, these common concerns highlight the stress that health care workers experience on the job and the need for supports to prevent burnout.

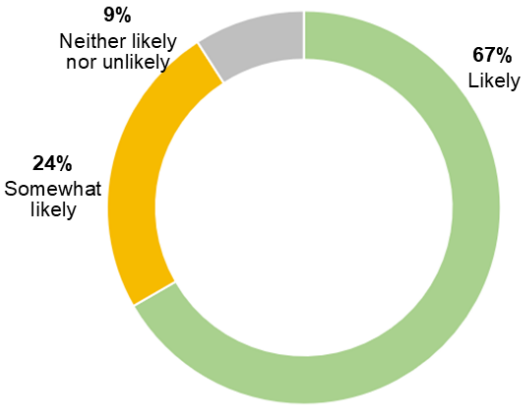
Some leaders were also concerned that **continued limitations may remain** after the pandemic subsides. For example:

- "Future students may be impacted by continued restrictions in the clinical learning environment which places extra burden on the education partner to provide virtual simulation and alternative clinical experiences as possible..."

- "The most pressing issue for future students will be fatigue and burnout for our current preceptors and teachers. The unprecedented times have created additional priorities for our clinicals and has resulted in some burnout. This is on top of a region that is already above capacity for student clinical placement needs."

Despite challenges experienced during the pandemic for health science students, the majority of organizational leaders indicated that they were **"likely"** (67%) or **"somewhat likely"** (24%) to recommend a health sciences career to future students. Only about 10 percent were indifferent (Figure 15.1 and Appendix B, Table 15.1).

Table 15.1. Likelihood of Recommending Health Science Careers to Future Students (n=92)



Indeed, some leaders believed that the COVID-19 pandemic would have positive impacts on future health sciences students. These leaders described improved **access to education** and an **increased interest in health science careers.** For example:

- "Healthcare careers will be attractive due to the essential nature of this work. COVID has emphasized the significance of public health and reinforced the far-reaching impacts of the healthcare system."

- "... I believe the pandemic may have a "9/11" effect on future students by inspiring students to seek a career in healthcare based on altruistic motivation to help in times of crisis..."
- "...in rural areas, or for students who did not have the ability to shadow/volunteer, innovations being addressed might ultimately help this population of students."

Respondents speculated in both directions: Some worry that fewer students will enter the health sciences due to physical safety and mental health concerns, while others believe more students will be drawn to help in a crisis situation. It is likely that both outcomes are true to some extent, and the ultimate impact on enrollment and entrance numbers remains to be seen.[3]

RECOMMENDATIONS FOR SUPPORTING STUDENTS

Leaders were asked to describe recommendations for supporting current and future health sciences students. Their responses can be categorized into the following recommendation areas:

- Encourage and promote health sciences careers.
- Offer more virtual learning experiences.
- Increase clinical rotations.
- Expand training efforts.
- Offer financial assistance.
- Ensure appropriate regulations.

Sample quotations provide more detail on these areas, as shown in Appendix B, Table 15.2.

CONCLUSION

At the end of the survey, we invited organizational leaders to share "any specific suggestions about health care delivery, health care organizations, and the health care workforce during the COVID-19 pandemic that you think is important for the General Assembly to consider as they plan for a future pandemic response" (Appendix F). Their responses can be grouped into the following topic areas, and sample quotations are provided in Appendix B, Table 16.1.

Emergency supplies: The most frequent topic area mentioned was emergency supplies such as PPE. When considering a potential future pandemic, leaders were concerned about adequate PPE supply as well as contingency plans for patient care.

Financial concerns: The second most frequent topic mentioned was financial concerns. Respondents mentioned the importance of small business loans, state-provided emergency equipment, and flexible reimbursement and payment processes. These financial supports limited the negative impact on health organizations' budgets, reducing furlough or termination of employees and ensuring critical patient services remained active.

System-wide planning: Many organizational leaders remarked on the importance of a well-planned, multidisciplinary pandemic response and wanted to see more emergency response coordination at the state and federal level.

Care delivery infrastructure: A number of respondents commented on expanding health care infrastructure to more effectively reach all North Carolinians, especially rural and vulnerable populations. Suggestions included expanding Medicaid, increasing pay for nurses and nursing assistants, enhancing support for low-income people, and improving telehealth services.

Communication: Leaders shared that conflicting guidance from different sources at different levels made it difficult to respond quickly and appropriately to the challenges of the COVID-19 pandemic, especially early on. They requested "unified messaging of guidance" from the state to the local level.

Government and policies: Many respondents wanted to see legislation to support pandemic preparation and safety efforts. Some commented on the need for state- and federal-level health crisis planning, while others wanted laws backing safety measures such as requiring masks and limiting hospital visitation.

Workforce staffing: Health care leaders were concerned about workforce shortages and recommended contingency planning for staffing, such as a reserve corps that can be called upon in an emergency. They also noted the necessity of adequate training and PPE for workers.

Training: Multiple leaders commented on the need for training and professional development. One respondent recognized that "it is hard to be prepared as we could experience any form of a pandemic" but that "basic processes and consistency would be beneficial."

Workforce support services: Many health care leaders shared how obstacles that individual workers faced in the pandemic aggregated to become obstacles for the organization. Though health care workers are recognized as "front line" or "essential" workers, supports are not always in place to ensure they are able to continue working. Leaders said their workers needed better access to child care, elder care, counseling, rapid testing, and financial assistance.

Regulations and licensure: Several comments highlighted how regulatory compliance can sometimes become an obstacle. Leaders mentioned the need for payment parity for telehealth services, for easing professional board mandates, and for allowing advanced practice providers to practice according to their full professional skillsets.

Overall, health care leaders expressed appreciation for the opportunity to share their front-line experiences with the North Carolina General Assembly.

[1] (a) Pathman et al., 2021 (b) Ehrlich, McKenney, & Elkbuli, 2020 (c) Bayham & Fenichel, 2020
[2] Though S704 specifically mentioned the impact of telehealth on *hospitals*, our findings were relatively consistent across settings. This section therefore includes responses from leaders of other types of settings that provide telehealth services.
[3] New York Times, 2021

Pandemic Health Care Workforce Study

S.L. 2020-3, Sec. 3D.6.

Appendix

A. DEFINITIONS

AHEC = Area Health Education Center Program

AHEC PO = Area Health Education Center Program Office in Durham, North Carolina

COVID-19 = SARS-CoV2/coronavirus disease of 2019

DHHS = Department of Health and Human Services

DPS = Department of Public Safety

HCWs = Health Care Workers

Health Care Systems = represented as a type of setting and included in this report
(Because many health care services and settings are consolidated within health care systems, there may be some overlap in responses for these two groups of health care leaders.)

Leaders = Health care organizational leaders that comprise this study sample

NC = North Carolina; also referred to as "the State"

PPE = personal protective equipment

Project Team = refers to the team of study coordinators, comprised of representatives from NC AHEC PO and the research team at the UNC-CH School of Nursing

S704 = Senate Bill 704 / SL 2020-3

UNC-CH = The University of North Carolina at Chapel Hill

B. DATA TABLES

Table 1.1. Leaders' Perceptions of Health Care Workforce Supply *within their Organizations* during the COVID-19 Pandemic, by Type

Role	*In short supply*			*Not in short supply*
	at pandemic start only	*both at start and in Oct-Nov 2020*	*in Oct-Nov 2020 only*	
*Medicine**	*8.5%*	*24.4%*	*3.7%*	*63.4%*
Physicians (n=82)**	7 (8.5%)	20 (24.4%)	3 (3.7%)	52 (63.4%)
Advanced Practice Providers	*6.5%*	*19.1%*	*2.7%*	*71.6%*
Physician Assistants (n=58)	4 (6.9%)	6 (10.3%)	4 (6.9%)	44 (75.9%)
Clinical Nurse Specialist (n=26)	2 (7.7%)	9 (34.6%)	0	15 (57.7%)
Nurse Practitioner (n=60)	2 (3.3%)	6 (10.0%)	4 (6.7%)	48 (80.0%)
Nurse midwives (n=23)	1 (4.3%)	3 (13.0%)	0	19 (82.6%)
Nurse anesthetists (n=29)	3 (10.3%)	8 (27.6%)	0	18 (62.1%)
Nurses & Nursing Groups	*7.4%*	*45.2%*	*11.7%*	*35.7%*
Registered nurses (n=85)	7 (8.2%)	41 (48.2%)	11 (12.9%)	26 (30.6%)
LPNs (n=62)	5 (8.1%)	22 (35.5%)	9 (14.5%)	26 (41.9%)
Nursing assistants (n=52)	3 (5.8%)	27 (51.9%)	4 (7.7%)	18 (34.6%)
Allied Health	*4.7%*	*19.2%*	*7.5%*	*68.6%*
Audiologists (n=17)	1 (5.9%)	1 (5.9%)	0	15 (88.2%)
Community health workers (n=23)	1 (4.3%)	3 (13%)	1 (4.3%)	18 (78.3%)
Dentists (n=25)	4 (16%)	4 (16%)	1 (4.0%)	16 (64.0%)
Dental Hygienists (n=20)	1 (5%)	2 (10%)	1 (5.0%)	16 (80.0%)
Lab Technicians (n=45)	1 (2.2%)	12 (26.7%)	7 (15.6%)	25 (55.6%)
Medical Assistants (n=61)	2 (3.3%)	17 (27.9%)	9 (14.8%)	33 (54.1%)
Medical interpreters (n=34)	1 (2.9%)	6 (17.6%)	5 (14.7%)	22 (64.7%)
Occupational therapists (n=34)	1 (2.9%)	3 (11.8%)	2 (5.9%)	26 (79.4%)
Paramedics, EMTs (n=19)	1 (5.3%)	4 (21.1%)	1 (5.3%)	13 (68.4%)
Pharmacists (n=42)	1 (2.4%)	2 (4.8%)	1 (2.4%)	38 (90.5%)
Pharmacy technicians (n=35)	1 (2.9%)	11 (31.4%)	1 (2.9%)	22 (62.9%)
Physical therapists (n=36)	1 (2.8%)	9 (25%)	3 (8.3%)	23 (63.9%)
Psychologists/behavioral health counselors (n=41)	3 (7.3%)	17 (41.5%)	5 (12.2%)	16 (39.0%)
Radiology technicians (n=32)	2 (6.3%)	6 (18.8%)	4 (12.5%)	20 (62.5%)
Recreational therapists (n=21)	1 (4.8%)	0	0	20 (95.2%)
Respiratory therapists (n=30)	1 (3.3%)	14 (46.7%)	5 (16.7%)	10 (33.3%)
Social workers (n=53)	2 (3.8%)	7 (13.2%)	4 (7.5%)	40 (75.5%)
Speech pathologists (n=29)	1 (3.4%)	4 (13.8%)	1 (3.4%)	23 (79.3%)
Ancillary Staff	*4.4%*	*20.8%*	*12.8%*	*62.0%*

Ancillary staff (n=61)	2 (3.3%)	11 (18.0%)	9 (14.8%)	39 (63.9%)
Housekeeping (n=55)	3 (5.5%)	13 (23.6%)	6 (10.9%)	33 (60.0%)

** For each category, listed is an average of the percentages of its roles.*
*** For each role,* n *is adjusted to remove "N/A or do not know" responses.*

Table 1.2. Leaders' Perceptions of Health Care Workforce Supply *within their Organizations* during the COVID-19 Pandemic, by Specialty Area

Specialty Area	*In short supply*			*Not in short supply*
	at pandemic start only	*both at start and in Oct-Nov 2020*	*in Oct-Nov 2020 only*	
Behavioral Health/Psychiatry (n=52)	4 (7.7%)	23 (44.2%)	9 (17.3%)	16 (30.8%)
Primary Care (n=55)	3 (5.5%)	23 (41.8%)	5 (9.1%)	23 (41.8%)
General Medical/Surgical (n=38)	3 (7.9%)	21 (55.3%)	3 (7.9%)	11 (28.9%)
Critical Care (n=32)	1 (3.1%)	17 (53.1%)	4 (12.5%)	10 (31.3%)
Emergency Care (n=30)	1 (3.3%)	14 (46.7%)	5 (16.7%)	10 (33.3%)
Geriatrics (n=34)	3 (8.8%)	13 (38.2%)	4 (11.8%)	14 (41.2%)
Public Health (n=26)	2 (7.7%)	9 (34.6%)	5 (19.2%)	10 (38.5%)
Employee Health (n=37)	1 (2.7%)	7 (18.9%)	5 (13.5%)	24 (64.9%)
Maternal & Newborn Health (n=30)	1 (3.3%)	7 (23.3%)	0	22 (73.3%)
Pediatrics (n=34)	2 (5.9%)	5 (14.7%)	1 (2.9%)	25 (73.5%)

** For each area,* n *is adjusted to remove "N/A or do not know" responses.*

Table 1.3. Effectiveness of Measures Taken to Bolster Workforce Supply

Strategies	*Very effective*	*Moderately effective*	*Slightly effective*	*Not effective*	*Not used*
Floating staff to other units and departments (n=105)	36 (34.3%)	16 (15.2%)	17 (16.2%)	9 (8.6%)	27 (25.7%)
Cross-training health care workers to practice in specialties/departments outside their "home" work unit (n=105)	31 (29.5%)	18 (17.1%)	16 (15.2%)	6 (5.7%)	34 (32.4%)
Premium pay for overtime, working extended shifts, or hazard (n=110)	20 (18.2%)	21 (19.1%)	20 (18.2%)	4 (3.6%)	45 (40.9%)
External supplemental staffing, such as locum tenens or travel nurses (n=108)	20 (18.5%)	16 (14.8%)	14 (13.0%)	8 (7.4%)	50 (46.3%)
Internal supplemental staffing, such as per diem staff (n=108)	16 (14.8%)	21 (19.4%)	19 (17.6%)	4 (3.7%)	48 (44.4%)
Changes to speed up hiring and onboarding processes (n=107)	11 (10.3%)	25 (23.4%)	19 (17.7%)	15 (14.0%)	37 (34.6%)
Implementing new or enhancing employee wellness and resilience programs (n=105)	13 (12.4%)	15 (14.3%)	25 (23.8%)	12 (11.4%)	40 (38.1%)

Closing beds (n=104)	11 (10.6%)	5 (4.8%)	11 (10.6%)	8 (7.7%)	69 (66.4%)
Diverting patients to other organizations (n=103)	8 (7.8%)	7 (6.8%)	10 (9.7%)	11 (10.7%)	67 (65.1%)

Table 2.1. Organizational Experiences with a COVID-19 Surge (n=115)

Description	*n (%)*
Experienced surge	60 (52.2%)
Less than 1 week	1 (1.7%)
1-2 weeks	3 (5.0%)
2-4 weeks	5 (8.3%)
1-2 months	6 (10.0%)
2-3 months	6 (10.0%)
3-4 months	1 (1.7%)
>4 months	1 (1.7%)
Still ongoing	35 (58.3%)
Did not experience surge	49 (42.6%)
Unsure or N/A	6 (5.2%)

Table 4.1. Leaders' Perceptions of Health Care Workforce Supply *in their Communities* during the COVID-19 Pandemic, by Type

	In short supply			*Not in short supply*
	at pandemic start only	*both at start and in Oct-Nov 2020*	*in Oct-Nov 2020 only*	
Medicine				
Physicians (n=54)*	9 (16.1%)	22 (39.3%)	3 (5.4%)	20 (35.7%)
Advanced Practice Providers				
Physician Assistants (n=38)	4 (10.0%)	10 (25.0%)	0	24 (60.0%)
Clinical Nurse Specialists (n=20)	2 (9.1%)	8 (36.4%)	3 (13.6%)	7 (31.8%)
Nurse Practitioners (n=42)	4 (9.3%)	13 (30.2%)	3 (7.0%)	22 (51.2%)
Nurse midwives (n=22)	1 (4.2%)	7 (29.2%)	0	14 (58.3%)
Nurse anesthetists (n=25)	4 (14.8%)	8 (29.6%)	1 (3.7%)	12 (44.4%)
Nurses & Nursing Groups				
Registered Nurses (n=60)	9 (15.0%)	33 (55.0%)	10 (16.7%)	8 (13.3%)
Licensed Practical Nurses (n=39)	4 (10.0%)	16 (40.0%)	7 (17.5%)	12 (30.0%)
Nursing Assistants (n=39)	7 (17.1%)	22 (53.7%)	4 (9.8%)	6 (14.6%)
Allied Health				
Audiologists (n=16)	2 (11.1%)	3 (16.7%)	1 (5.6%)	10 (55.6%)
Community health workers (n=23)	4 (16.7%)	7 (29.2%)	1 (4.2%)	11 (45.8%)

Dentists (n=23)	4 (16.7%)	8 (33.3%)	1 (4.2%)	10 (41.7%)
Dental Hygienists (n=21)	2 (8.7%)	4 (17.4%)	1 (4.4%)	14 (60.9%)
Lab Technicians (n=31)	3 (9.1%)	11 (33.3%)	3 (9.1%)	14 (42.4%)
Medical Assistants (n=37)	5 (12.8%)	14 (35.9%)	4 (10.3%)	14 (35.9%)
Medical Interpreters (n=31)	2 (6.1%)	10 (30.3%)	4 (12.1%)	15 (45.5%)
Occupational Therapists (n=28)	4 (13.3%)	6 (20.0%)	3 (10.0%)	15 (50.0%)
Paramedics, EMTs (n=19)	3 (15.0%)	5 (25.0%)	0	11 (55.0%)
Pharmacists (n=29)	3 (9.7%)	5 (16.1%)	1 (3.2%)	20 (64.5%)
Pharmacy technicians (n=27)	1 (3.5%)	11 (37.9%)	3 (10.3%)	12 (41.4%)
Physical Therapists (n=27)	3 (10.3%)	9 (31.0%)	3 (10.3%)	12 (41.4%)
Psychologists/behavioral health counselors (n=36)	5 (13.5%)	21 (56.8%)	5 (13.5%)	5 (13.5%)
Radiology technicians (n=22)	3 (12.5%)	6 (25.0%)	1 (4.2%)	12 (50.0%)
Recreational Therapists (n=15)	1 (5.9%)	2 (11.8%)	0	12 (70.6%)
Respiratory therapists (n=27)	2 (6.9%)	13 (44.8%)	7 (24.1%)	5 (17.2%)
Social Workers (n=35)	4 (11.1%)	8 (22.2%)	2 (5.6%)	21 (58.3%)
Speech Pathologists (n=27)	3 (10.3%)	6 (20.7%)	1 (3.5%)	17 (58.6%)
Ancillary Staff				
Ancillary staff (n=39)	2 (4.9%)	12 (29.3%)	3 (7.3%)	22 (53.7%)
Housekeeping (n=36)	2 (5.3%)	12 (31.6%)	7 (18.4%)	15 (39.5%)

** For each role,* n *is adjusted to remove "N/A or do not know" responses.*

Table 5.1. Adequacy of PPE, Overall and by Setting

	Start of COVID-19		*Time of survey (October 2020)*		*Future expectations*	
	Adequate supply of appropriate PPE	*Adequate, rapid access to additional PPE*	*Adequate supply of appropriate PPE*	*Adequate, rapid access to additional PPE*	*Adequate supply of appropriate PPE*	*Adequate, rapid access to additional PPE*
Overall (n=115)						
Agree	59 (52.7%)	50 (44.2%)	86 (74.8%)	73 (64.2%)	78 (67.8%)	67 (58.8%)
Neither *A* nor *D*	3 (2.7%)	7 (6.2%)	10 (8.7%)	13 (11.5%)	22 (19.1%)	26 (22.8%)
Disagree	50 (44.6%)	56 (49.6%)	19 (16.5%)	27 (23.9%)	15 (13.0%)	21 (18.4%)
Health System (n=14)						
Agree	10 (71.4%)	8 (57.1%)	11 (78.6%)	9 (64.3%)	10 (71.4%)	7 (50%)
Neither *A* nor *D*	0	0	1 (7.1%)	1 (7.1%)	3 (21.4%)	2 (14.3%)
Disagree	4 (28.6%)	6 (42.9%)	2 (22.2%)	4 (28.6%)	1 (7.1%)	5 (35.7%)
Hospital (n=14)						
Agree	12 (75.7%)	10 (71.4%)	11 (78.6%)	10 (71.4%)	10 (71.4%)	9 (64.3%)
Neither *A* nor *D*	0	0	2 (14.3%)	2 (14.3%)	4 (28.6%)	4 (28.6%)
Disagree	2 (14.3%)	4 (28.6%)	1 (7.1%)	2 (14.3%)	0	1 (7.1%)
Ambulatory Care (n=20)						
Agree	10 (50%)	11 (57.9%)	12 (60%)	8 (40%)	13 (65%)	11 (55%)
Neither *A* nor *D*	2 (10%)	2 (10.5%)	2 (10%)	3 (15%)	4 (20%)	5 (25%)

Disagree	8 (40%)	6 (31.6 %)	6 (30%)	9 (45%)	3 (15%)	4 (20%)
Primary Care (n=33)						
Agree	15 (45.5%)	9 (27.3%)	26 (76.5%)	21 (63.6%)	19 (55.9%)	17 (50%)
Neither *A* nor *D*	0	2 (6.1%)	2 (5.9%)	3 (9.1%)	6 (17.7%)	8 (23.5%)
Disagree	18 (54.5%)	22 (66.7%)	6 (17.6%)	9 (27.3%)	9 (28.5%)	9 (34.5%)
Long-Term Care (n=17)						
Agree	4 (23.5%)	5 (29.4%)	16 (94.1%)	15 (88.2%)	15 (88.2%)	14 (82.4%)
Neither *A* nor *D*	1 (5.9%)	2 (11.8%)	1 (5.9%)	1 (5.9%)	2 (11.8%)	3 (17.7%)
Disagree	12 (70.6%)	10 (58.8%)	0	1 (5.9%)	0	0
Home Care Agencies (n=10)						
Agree	6 (60%)	6 (60%)	7 (70%)	6 (66.7%)	7 (70%)	5 (55.6%)
Neither *A* nor *D*	0	0	1 (10%)	2 (22.2%)	1 (10%)	2 (22.2%)
Disagree	4 (40%)	4 (40%)	2 (20%)	1 (11.1%)	2 (20%)	2 (22.2%)
Correctional Facilities (n=6)						
Agree	2 (50%)	1 (16.7%)	3 (50%)	4 (66.7%)	4 (66.7%)	4 (66.7%)
Neither *A* nor *D*	0	1 (16.7%)	1 (16.7%)	1 (16.7%)	2 (33.3%)	2 (33.3%)
Disagree	2 (50%)	4 (66.7%)	2 (33.3%)	1 (16.7%)	0	0

Table 6.1. Leaders' Perceptions of Staff Concerns during the COVID-19 Pandemic

Areas of Concern	*Very concerned*	*Moderately concerned*	*Slightly concerned*	*Not at all concerned*
Fear of Exposure (n=111)	84 (75.7%)	18 (16.2%)	7 (6.3%)	2 (1.8%)
Safety of Self & Others (n=109)	74 (67.9%)	22 (20.2%)	10 (9.2%)	3 (2.8%)
Child Care (n=111)	76 (68.5%)	21 (18.9%)	10 (9%)	4 (3.6%)
Preventing Burnout (n=104)	47 (45.2%)	31 (29.8%)	17 (16.4%)	9 (8.7%)
Elder Care (n=101)	30 (29.7%)	34 (33.7%)	27 (26.7%)	10 (9.9%)
Acquiring Food/Supplies (n=82)	17 (20.7%)	30 (36.6%)	17 (20.7%)	18 (22.0%)
Access to Counseling (n=81)	13 (16.1%)	24 (29.6%)	22 (27.2%)	22 (27.2%)
Taking Breaks (n=76)	7 (9.2%)	21 (27.6%)	22 (29.0%)	26 (34.2%)
Transportation (n=72)	5 (7.0%)	12 (16.7%)	24 (33.3%)	31 (43.1%)
Housing for Staff/Family (n=74)	4 (5.4%)	16 (21.6%)	22 (29.7%)	32 (43.2%)

Table 6.2. Supports Provided & Used by Workers (n=115)

Support Area	*Provided by Organizations*	*Used by Workers*
Childcare	26%	41%
Counseling Services	51%	36%
Adequate Time Off	49%	36%
Resiliency Training	38%	31%
Elder Care	9%	23%
Housing for Staff/Family	10%	17%

Transportation	3%	13%
Extra Staff	13%	12%

Table 6.3. Additional Supports Needed for Workers in a Future Health Care Crisis (n=86)

Support Area	*#**	*Example Quotations*
Childcare	27	• "Childcare was biggest issue" • "Childcare, ongoing scheduling flexibility due to school closures"
Wellness & Counseling	15	• "On site counseling for employees" • "Compassion training for providers and staff" • "Affordable mental health support" • "Additional wellness/health resources for staff"
Financial Resources	12	• "Financial resources to offset out of budget costs for testing and COVID response" • "More funds to pay hazard pay" • "War time pay for those working in critical care pandemic units"
Additional Staff	11	• "Extra staffing to manage pandemic-specific workload (screening stations, testing sites)" • "Simply having a more adequate workforce available with a sufficient supply of trained, direct care employees would help. This would eliminate the overtime demands, allow for adequate quarantining when necessary, foster creativity in scheduling, etc."
PPE Access	9	• "Easier access for companies to acquire PPE – this was a time intensive process"
Flexible Scheduling or Time Off	8	• "Ongoing scheduling flexibility and child care needs" • "Flexibility for personal needs within reason that doesn't hugely hinder the company" • "School and daycare closures created unanticipated parental child-care challenges. Limited supports and solutions made resignation a real possibility for long tenured employees suddenly forced into a new work-life balance. Immediate and ongoing childcare coverage protects staffing levels. Employees with medical vulnerabilities were not accounted for prior to the pandemic. Planning could better anticipate absences and implement more robust protective measures to balance provider safety with workforce staffing levels."
Health Education	6	• "For educational purposes, a consistent bandwidth and widespread availability of internet resource will be key. Minimum technology requirements will be set as well for incoming students in preparation of a future pandemic. Faculty will need in-depth training on how to deliver content via multiple platforms." • "…provide [health care workers] with disaster training" • "Training options for students/learners"
Improved Communication	5	• "Consistent information from federal agencies related to the disease and prevention" • "Clear, evidence-based direction changing as infrequently as possible"

		• "Implementing lessons learned" • "Enhanced communication is always a need."
Elder care	4	• "Childcare and elder care. Care for loved ones infected." • "…care for elderly parents"
Future planning	3	• "The workforce has to be supported adequately BEFORE a pandemic. It was not before this pandemic. Support was provided during the pandemic, but it was provided to an already depleted workforce that was put under much greater strain. We must grow this workforce to an adequate number, and the only way to do that is make the profession more appealing through wage increases, benefit increases, etc." • "Need to have a plan for future pandemic or climate issues for staffing and resource allocation"
Other	16	e.g., improved public transportation, training for non-clinical staff to assist in meeting the surge demands of this and similar pandemics, more leniency to use temporary licensures and certifications for support positions, resources to provide remote work opportunities

***** *Number of times leaders identified each area of support in their responses.*

Table 7.1. Duration of Service Cancellation due to COVID-19 in All Settings, by Service Type

Impact	*<1 week*	*2-4 weeks*	*1-2 months*	*>2 months*	*Indefinitely*
Elective surgeries (n=49)	3 (6%)	7 (14%)	23 (47%)	13 (27%)	3 (6%)
Outpatient surgeries (n=47)	3 (6%)	9 (19%)	18 (38%)	14 (30%)	3 (6%)
Radiology imaging (n=38)	11 (29%)	11 (29%)	7 (18%)	3 (8%)	6 (16%)
Dental procedures (n=37)	1 (3%)	5 (14%)	12 (32%)	13 (35%)	6 (16%)
Rehabilitation services (n=36)	8 (22%)	6 (17%)	9 (25%)	6 (17%)	7 (19%)
Chemotherapy (n=24)	13 (54%)	2 (8%)	1 (4%)	1 (4%)	7 (29%)
Transplants (n=20)	7 (35%)	2 (10%)	1 (5%)	3 (15%)	7 (35%)

Table 8.1. Impacts of Postponing or Eliminating Services on Health Care Organizations, by Type

Impact	*All Organizations (n=75)*	*Hospitals only (n=14)*	*Rural hospitals only (n=10)*
Financial losses	65 (87%)	11 (79%)	9 (90%)
Shift to telehealth	54 (72%)	8 (57%)	7 (70%)
Furloughed or terminated staff	26 (35%)	7 (50%)	8 (80%)
Temporary suspension of certain services	33 (44%)	7 (50%)	7 (70%)
Temporary closure of beds or offices	24 (32%)	3 (21%)	2 (20%)
Changed other organizational practices	20 (27%)	2 (14%)	3 (30%)
Permanent cancellation of certain services	7 (9%)	3 (21%)	2 (20%)
Population of patients changed	10 (13%)	2 (14%)	2 (20%)
Diverted patients to other entities or offices	14 (19%)	2 (14%)	1 (10%)
Permanent closure of beds or offices	1 (1%)	1 (7%)	1 (10%)

Table 8.2. Duration of Service Interruption *in Hospitals Only*, by Service Type

Impact	*<1 week*	*2-4 weeks*	*1-2 months*	*>2 months*	*Indefinitely*
Elective surgeries (n=14)	1	2	7	4	0
Outpatient surgeries (n=13)	1	3	5	4	0
Radiology imaging (n=11)	6	3	1	1	0
Dental procedures (n=7)	1	0	5	1	0
Rehabilitation services (n=12)	4	2	4	2	0
Chemotherapy (n=8)	7	0	0	1	0
Transplants (n=6)	3	0	1	2	0

Table 11.1. Leaders' Perceptions of the Effectiveness of Telehealth, by Service Area

Service Area	*Very or extremely effective*	*Slightly or moderately effective*	*Not effective at all*
Routine health care (n=79)	46 (58%)	30 (38%)	3 (4%)
Emergency health care (n=46)	15 (33%)	27 (59%)	4 (9%)
Routine behavioral health care (n=63)	33 (52%)	26 (41%)	4 (6%)
Emergency behavioral health care (n=41)	17 (41%)	20 (49%)	4 (10%)

Table 12.1. Impacts of Telehealth on Health Care Organizations and Workers (n=116)

Positive Impacts with Sample Responses	*Negative Impacts with Sample Responses*
Maintain and expand care services • "[Telehealth] Increased our [patient] volumes by providing another option for care and easy access." • "It has allowed the DME [Durable Medical Equipment] and Home Care companies to have greater reach to the larger population needing care and identifying additional needs." • "Telehealth has allowed providers to maintain practices in the face of closures and restrictions." *Reduced operating costs* • "…The option of having a healthcare worker contact a patient prior to an in-person visit to review history and risk factors,	*Sense of urgency amid limited resources* • "We have to urgently put in place the needed systems to comply with insurance regulations for billing for services, while educating staff and patients on the use of this new service line." • "Our organization was challenged to quickly implement and support telehealth training for 400+ providers and office staff in a very short period of time. The staff were challenged with limited time and resources to help patients get connected, and several patients in remote areas had limited connectivity." *Security concerns* • "Technology can be troublesome at times and [in] ensuring the security side of telehealth." • "[Challenges include] maintaining confidentiality, getting informed consent, providing secure delivery of services and records"

can definitely cut down on in-office time and hopefully lower overhead costs." *Support of PPE conservation efforts* • "…Helps with PPE conservation and could reduce the risk of exposure in the clinics…" *Worker retention* • "…Allowed the means to continue delivery of care and not furlough individuals due to reduced volumes." *New and supportive scheduling options for workers* • "For our employees, [telehealth] has been preferable as they can work from home when needed which takes the strain off of getting childcare for their children." *Decreased safety risks for workers* • "MDs with pre-existing conditions could continue to practice while remaining safe."	*Revenue losses* • "As a Hospital Based Clinic/Provider Based Clinic, we lost revenue because the nurses were no longer involved in the provision of care." • "Telehealth as a mode of delivering healthcare services should be expanded and refined and should remain an option for care for patients who are able to participate. Payers should recognize this as a value-added service and should continue providing reimbursement for telehealth services as we move forward." *Inconsistent care delivery requirements* • "Guidelines need to be developed for nurse practitioners working across state lines during a pandemic. The restrictions were relaxed with our border states, but each state has different requirements you must follow. *Increased workload for workers (due to training needs or additional processes)* • "There is increased workload and more processes involved with telehealth visits. Support staff have had to learn new skills and have had to adapt workflows to support telehealth visits." • "At times [telehealth requires] more paperwork to get authorization and consent; [we have to provide] education of the team to bill and collect these payments." *Stress/burnout for workers* • "While increasing capabilities for patient care, it has contributed to additional levels of stress and burnout, particularly for older staff and providers."

Table 13.1. Leaders' Expectations for Resuming Suspended Services by June 30, 2021 (n=114)

Response	*n (%)*
Suspended services will be resumed	78 (68.4%)
To pre-pandemic levels	50 (64.1%)
Below pre-pandemic levels	7 (9.0%)
Above pre- pandemic levels	21 (26.9%)
Suspended services will not be resumed	17 (14.9%)
Do not know	19 (16.7%)

Table 14.1. Leaders' Perceptions on Health Care Workers' Preparedness to Meet Needs of Vulnerable Populations (n=110)

	n (%)
Very well prepared	28 (25.5%)
Prepared	46 (41.8%)
Moderately prepared	25 (22.7%)
Slightly prepared	10 (9.1%)
Not prepared	1 (0.9%)

Table 15.1. Leaders' Likelihood of Recommending Health Science Careers to Future Students (n=115)

	n (%)
Very likely	66 (66.7%)
Somewhat likely	24 (24.2%)
Neither likely nor unlikely	9 (9.1%)
Somewhat unlikely	0
Very unlikely	0

Table 15.2. Recommendations for Supporting Students (n=74)

Recommendation Areas	*Sample Responses*
Encourage and promote health sciences careers	• "It should be an encouraged field to ensure structure in this area for our future needs in healthcare." • "We can increase the level of education for current and future students to give them a foundation of knowledge verses fear of pandemics. They need to see the need and impact they can have in the industry."
Offer more virtual learning experiences	• "More support of simulation - including more space and funding for people to create and run these in programs will likely be needed. Need to resolve lack of broad band access for some students in select areas where there is poor access to internet for classes delivered like this."
Increase clinical rotations	• "Expansion of rotations to all areas of system, not just clinical spaces, so that there is an understanding of the interdependencies of each department in a health system." • "Expand rotations to be not just acute care. Teach about quality and safety practices that impact care."
Expand training efforts	• "More emphasis on PPE instruction and checkoffs regarding various types of PPE before students are sent out for clinicals. Also, curriculum and goals and objectives should be re-evaluated to incorporate some type of telehealth experiences for medicine, APPS, pharmacy, etc." • "Utilization of technology, additional training for emergent public health threats" • "... Include pandemic/crisis care as part of curriculum. Special focus on infection prevention/pandemics/epidemiology in student programs...."

Offer financial assistance	• "Financial aid is a big need." • "Better scholarship opportunities, more professors, better professor pay" • "Figure out tech for virtual shadowing, need money to support innovative virtual learning for students, and need money for PPE for students." • "…If PPE continues to be a challenge for individuals to obtain, and clinical sites require students to supply their own, then PPE should be made available [on campus] for financial aid purposes...."
Ensure appropriate regulations	• "Schools need to do fit testing, regular screening/testing of students and supply PPE" • "I believe clinical sites should provide PPE for students since the school does not have first priority for purchasing during times of limited PPE availability." • "Address the liability issue so they can continue to train within our facilities." • "More accessible testing for students, vaccines…"

Table 16.1. Leaders' Suggestions to the General Assembly on Planning for Future Pandemics (n=98)

Topic Areas	*#**	*Sample Responses*
Emergency supplies	27	• "Planning for PPE [personal protective equipment] shortages has to occur much quicker than when down to 7 days supply (state would not allow requests prior to this). Obviously want to avoid stockpiling – however need time to train and deploy." • "Rapid access to supplies to care for patients, identification of contingency locations for patient care, i.e. facilities that can be set up as field hospitals, support for coordination of patient care needs among health systems across the state." • "PPE should be readily available for future events" • "Special attention needs to be given to ensure that all healthcare workers have easy and adequate access to PPE."
Financial	24	• "The essential support for us to stay in business was the ability to get a small business loan and advanced Medicare payments with the option to pay back over a longer period of time. This kept us from furloughing employees and kept them out of the population on unemployment, which is unsustainable for our government. Very concerned about the future economic impacts of this on our business and country, in general." • "Continue to support SBA loan access and state-provided PPE and or other emergency-related needs." • "Payers will need to be flexible and move swiftly to ensure that services are paid for so that providers, staff and healthcare systems can continue providing critical services to patients."

Planning	15	• "State level data and coordination were important to our response. Community agencies (non-profits, and local governments) will need support to ensure that they can deliver services to vulnerable populations." • "Pandemic Planning Task Force, had one at federal level that was disbanded. But, do we have one at the state level? We need a pandemic plan. We need one at state and federal level that is multidisciplinary. Also didn't know 2020 would awaken us to racial and social health care disparities…Pandemics take advantage of these things and addresses inequities so we have less ground to make up from." • "Health care organizations should work together to provide a community wide coordinated response to pandemic. A multidisciplinary approach to involving health dept, EMS, community health centers (FQHC), and local hospitals need to communicate to provide a unified response."
Care delivery infrastructure	13	• "Expand Medicaid to meet the needs of the lower socioeconomic groups to lessen their vulnerability." • "It is important to ensure hospitals have the tools we need to expand access to care to rural populations: Medicaid expansion, durable and effective telehealth platforms with appropriate broadband, increased pay or subsidies for RNs and CNAs." • "The health care delivery system should provide more options for those currently unemployed, uninsured, low income, and/or homeless. More support should be readily available to health care organizations during a pandemic and should remain intact during "normal" phases, so that it is always available and resources are present." • "Ensure telehealth delivery is fully enabled with expansion of broadband access. Ensure state reimbursement are adequate and commercial insurers are bound to COVID level reimbursement for tele services. Ensure future digital care delivery isn't hindered by the state where providers are licensed."
Communication	11	• "Have unified messaging of guidance from state through local level." • "Coordinating communications across our division became vital in the early stages of planning as our service lines and front line staff were receiving conflicting guidance across many professional organizations, service lines and social media outlets. We recognized a need for a "Communications Group"…Having one source driving communications may provide consistency and decrease some confusion on expectations in real time." • "Communication and transparent honesty is important for health professionals. If what they are being told conflicts with what they were told last week, or what they learned in their college courses, it will raise concern…Create that communication line early and use it often to gather information regularly, especially when it is really needed like a crisis."
Government and policies	11	• "Encourage the Federal Government to re-establish the Pandemic Response agency. Don't play politics with NC residents' lives." • "… Make unauthorized access to a healthcare facility illegal. We fought and continue to struggle to maintain a safe environment for our patients and staff by requiring masks and limiting visitation which is ignored in many cases. It is disheartening to provide a mask to a visitor and see it in the first available trash basket."

Workforce staffing	11	• "Have the necessary resources in place such as nurses/ physicians/ support staff, PPE, respirators and education in emergent care." • "North Carolina should institute a reserve corps that can be called and paid appropriately to support current staff." • "Staffing contingencies is of primary importance, and this includes ensuring they are protected with adequate PPE and training."
Training	9	• "Organizations should prepare workers constantly for potential emergencies." • "I can't say it enough "education" so much of the workforce and organization were not educated and prepared for a pandemic. I do understand it is hard to be prepared as we could experience any form of a pandemic but basic processes and consistency would be beneficial, which I know is a challenge as well." • "We need to think about the skill sets that best meet the needs of NC and how best to support training and practice!"
Workforce support services	8	• "Two obstacles that impacted us the most was when the schools closed it created hardships for our staff in not having ample daycare options and with the unemployment payout being set so high it became an issue with recruiting and retaining Nursing Assistants – they chose not to work and draw unemployment." • "Counseling should be provided to healthcare workers and testing needs to be available and provided for free to healthcare workers." • "Healthcare staff need access to resources so that they can continue to provide critical services during a pandemic (childcare, eldercare, access to rapid testing). Community members who are furloughed or laid off need financial assistance to ensure they can afford healthcare services."
Regulations and licensure	7	• "There should be payment parity for telehealth visits - the same as an in-person visit. While that exists now, it should be put in place permanently, as a way to encourage providers to keep providing this service even after COVID." • "NPs functioning to full practice is possibly the biggest issue." • "Decrease professional board mandates related to telehealth."

***** *Number of times leaders identified each topic area in their responses.*

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D. S704 LEGISLATION

GENERAL ASSEMBLY OF NORTH CAROLINA

SESSION 2019

SESSION LAW 2020-3

SENATE BILL 704

AN ACT TO PROVIDE AID TO NORTH CAROLINIANS IN RESPONSE TO THE CORONAVIRUS DISEASE 2019 (COVID-19) CRISIS.

…

PANDEMIC HEALTH CARE WORKFORCE STUDY

SECTION 3D.6.(a) The mission of the North Carolina Area Health Education Center (NC AHEC) is to meet the State's health and health workforce needs and to provide education programs and services that bridge academic institutions and communities to improve the health of the people of North Carolina, with a focus on underserved populations. Consistent with that mission, the North Carolina General Assembly directs the NC AHEC program to conduct a study of the issues that impact health care delivery and the health care workforce during a pandemic. The study shall focus on the impact of the COVID-19 pandemic, issues that need to be addressed in the aftermath of this pandemic, and plans that should be implemented in the event of a future health crisis.

SECTION 3D.6.(b) The study shall include input from universities, colleges, and community colleges that educate health care providers; health care provider licensing boards; the Department of Health and Human Services; the Department of Public Safety; and geographically disbursed rural and urban hospitals, ambulatory surgical centers, primary care practices, specialty care practices, correctional facilities, group homes, home care agencies, nursing homes, adult care homes, and other residential care facilities.

SECTION 3D.6.(c) The study shall include, but is not limited to, examination of, and reporting on, the issues outlined below:

(1) Adequacy of the health care workforce supply to respond to a pandemic in the following settings: acute care, ambulatory, primary care, nursing homes, adult care homes, other residential care facilities, correctional facilities, and in-home care.

(2) Adequacy of the health care workforce supply to address the COVID-19 surge; the ability to redirect the existing workforce supply to meet staffing demands, including the identification of any barriers; and recommendations to eliminate barriers and readily deploy staffing in a future health crisis.

(3) Adequacy of the health care workforce training, by setting, and the need for additional training or cross-training of health care providers.

(4) Impact of the COVID-19 pandemic on communities with preexisting workforce shortages.

(5) Impact of personal protective equipment (PPE) availability on the health care workforce, by setting.

(6) Sufficiency of support mechanisms for the health care workforce, including the availability of child care, transportation, mental health and resilience support services, and other support items.

(7) Impact of postponing or eliminating nonessential services and procedures on the health care workforce.

(8) Impact of postponing or eliminating nonessential services and procedures on hospitals, particularly rural hospitals.

(9) Interruptions in the delivery of routine health care during the COVID-19 pandemic and the impact to citizens, primary and specialty care practices, and the health care workforce employed in these practices.

(10) Impact of the COVID-19 pandemic on the delivery of behavioral health services.

(11) Ability of telehealth options to deliver routine and emergent health and behavioral health services to patients.

(12) Impact of telehealth on hospitals during the COVID-19 pandemic.

(13) Support necessary to resume health care delivery to pre-pandemic levels.

(14) Ability of the health care workforce and health care delivery structure to respond to the needs of minority populations, individuals with health disparities, and individuals and communities with increased health risks, during a pandemic.

(15) Impact of the COVID-19 pandemic, including concerns surrounding PPE availability, on current health sciences students and implications for future students contemplating a career in health sciences.

SECTION 3D.6.(d) The NC AHEC shall report findings and recommendations to the House Select Committee on COVID-19, Health Care Working Group, on or before November 15, 2020. The report shall include a summary section to provide a high-level debriefing to the State's leaders, health care providers, and others, on successes and priority items to address as the State moves forward.

SECTION 3D.6.(e) Due to the evolving nature of the COVID-19 pandemic, the NC AHEC has authority to report subsequent study findings and recommendations, as appropriate, to the House Appropriations Subcommittee on Health and Human Services, the Senate Appropriations Committee on Health and Human Services, and the Joint Legislative Oversight Committee on Health and Human Services.

SECTION 3D.6.(f) This section is effective when it becomes law.

…

E. DETAILED STUDY METHODS

SAMPLE

Data for this study was gathered from two health care-related groups: (1) health care settings that directly deliver care and (2) other settings that educate, regulate, and support the oversight of health care organizations and the workforce. Health care settings included: rural and urban hospitals (including the primary hospital/health system with which the AHEC regional office is affiliated); ambulatory surgical centers; primary care practices; specialty care practices; correctional facilities; group homes; home care agencies; and nursing homes, adult care homes, and other residential care facilities. Other settings included: universities, colleges, and community colleges that educate health care providers; health care provider licensing boards; the Department of Health and Human Services; the Department of Public Safety; and leaders in select health care systems.

AHEC regional offices are in key positions to engage local stakeholders because they are known to health care organizations and leaders in their region, and they are familiar with the cultures and populations within which they will be gathering data. The AHEC leveraged capacity in its nine (9) regional AHEC Centers -- plus the Duke AHEC Program Office -- to gather data and information from local community providers. To gain input from stakeholders in each region, each AHEC office identified and collected data from at least one "geographically disbursed rural and urban hospitals, ambulatory surgical centers, primary care practices, specialty care practices, correctional facilities, group homes, home care agencies, nursing homes, adult care homes, and other residential care facilities." Regional offices recruited organizations from at least three different counties in the regions they serve.

DATA COLLECTION

Designated members of each AHEC regional office served as liaisons between health care leaders in their communities, and the Project Team. The Project Team provided AHEC regional office staff with specific project details and the materials needed to contact and follow-up with organizational leaders and stakeholders in health care delivery settings. AHEC regional office staff in each AHEC region identified and recruited organizational leaders for study participation, and then facilitated the data collection process to address each of the S704 areas.

At least one organizational leader from each type of setting was recruited from three counties in each AHEC region, including the county in which the AHEC regional office was located. The Project Team coordinated recruitment and study activities with AHEC regional staff and provided technical support to the AHEC regional offices and survey respondents during the active phase of the survey and data collection. The engagement of AHEC staff was critical in the conduct of this study, as they contributed unique and regularly updated information about the impacts of COVID-19 in each of their regional areas.

The NC AHEC Program leaders and the UNC-CH Project Team recruited and gathered data from the other health care-related settings outlined in S704. Additionally, data were gathered from

leaders of professional organizations who represent key constituent health care worker groups. A data collection process similar to that for the health care delivery settings was followed.

Using either a secure, online Qualtrics survey or confidential virtual/telephone interviews, the AHEC regional offices, AHEC Program Office, and the Project Team gathered information from key leaders in health care-related settings across North Carolina in each of the 15 areas outlined in S704. Guided by information requested in S704, both the surveys and interviews were developed from the literature, ongoing research, and the Project Team's expertise in and knowledge of the health care workforce. The surveys and interviews were reviewed and "pilot-tested" by the AHEC regional office leaders to be sure that relevant details were addressed in the study. These two data collection approaches that were used offered maximum flexibility for encouraging leader and organizational participation during the COVID-19 pandemic.

The Project Team trained all AHEC regional office staff in using the online survey platform, and in completing surveys and conducting interviews. Some AHEC Regional Office Directors conducted a personal interview with health care organizational leaders in their region or designated one of their office staff members to do so. Therefore, leaders could choose whether to participate in the study by completing an online survey through a secure site, or they could provide information through a confidential interview scheduled with a staff member in the AHEC regional office where the organization was located, or with a member of the Project Team. Those who chose to complete the online survey did so through a secure link. Those who chose to participate in a confidential interview were scheduled for the interview to occur by telephone or via an online platform, and information was subsequently entered into the online survey for analysis. In both cases, data were often gathered from multiple sources within each organizational type.

DATA MANAGEMENT AND CONFIDENTIALITY

This study was approved and deemed exempt from the Institutional Review Board (IRB) at UNC-CH. Additional IRB processes were initiated by the AHEC Regional Offices and this study was approved at Cone Health, Duke Health, Atrium Health, New Hanover Regional Medical Center, Cape Fear Valley Medical Center, and WakeMed. Because of the sensitive and comprehensive nature of the information sought in this survey, several steps were taken to protect study participants and the confidentiality of the organizations they represented. Leaders were provided an informed consent form, asked to voluntarily agree to participate in the study, and were notified that they could end the survey at any point. All information provided by leaders was protected using a numeric coding system, and then data were stored securely in an online location that was dedicated to this project. Thus, all data gathered in this study were 1) were protected and treated as confidential, 2) have been aggregated to represent groups of interest to the General Assembly (where possible), and 3) are reported in groups and by each of the 15 areas outlined in S704.

CONSIDERATIONS FOR DATA COLLECTION

Despite the continued prevalence of COVID-19 in North Carolina, regional AHEC offices began outreach to providers and leaders in their catchment areas in August/early September, and data

collection occurred between October and early December. The survey remained open longer than anticipated at the outset of the project because of the surge of the COVID-19 pandemic within the state. Multiple attempts were made to support and maximize opportunities for organizational leaders to participate. The NC AHEC Program and the Project Team gathered data from state agencies, educational organizations, licensing boards and health professional associations on a similar timeframe. After data collection was complete, the Project Team analyzed all data, and collaborated with the UNC-CH AHEC Program office to prepare a report for submission to the N.C. General Assembly.

DATA ANALYSIS

Survey questions consisted of both closed- and open-ended questions to address the areas in S704. Incomplete surveys (i.e., those surveys that were not submitted by respondents) were excluded from analysis to avoid duplicate responses and the inclusion of surveys with large numbers of missing items. Thematic analysis of textual data in Atlas.TI and descriptive statistics of quantitative data in SAS were used to examine the impact of the COVID-19 pandemic on health care organizations and other settings. Preliminary findings were first provided to the AHEC Program Office, and then all findings were discussed with the AHEC Program Office and regional AHEC offices to ensure that data adequately captured the evolving situation in NC. This process yielded the results presented in this report, including a set of robust recommendations for the N.C. General Assembly to consider in its early 2021 meeting.

RESPONSE RATE

A total of 375 leaders of health care organizations were contacted and invited to participate in this study. Of these, 21 leaders declined to participate after this initial contact (5.6%) and 216 (58%) leaders verbally agreed to participate and were provided with the informed consent and survey link. Any organizational representative with partial survey completions received email or telephone follow-up by a regional AHEC staff member. In the end, completed surveys were received from leaders representing 115 organizations, for a survey response rate of 53%.

Additionally, leaders were contacted from organizations that educate, regulate, and support the oversight of the health care workforce. Responses were received from 32 of these leaders.

Pandemic Health Workforce Study

Start of Block: Introduction/consent

Thank you for your willingness to participate in this research study examining the effects of the COVID-19 pandemic on the health care workforce and the facilities where they work. This study is being conducted as directed in Senate Bill 704, passed by the North Carolina (NC) General Assembly in May 2020. This legislation directs the NC Area Health Education Centers (AHECs) to conduct a study of key areas outlined in the legislation that address the impact of COVID-19 on NC's health care workforce and organizations, and to identify strategies needed to address current and future concerns. **You have been asked to participate in this study because you are a key health care leader and stakeholder in NC**. A leader with administrative responsibility in the organization is best suited to provide the information requested and/or lead the gathering of information. Please feel free to consult departmental leaders within the organization, as needed, to gather survey information.

Checking the box below indicates that you have read the informed consent document that was sent to you in an invitational email, and that you agree to participate in this survey. As a reminder, no individuals or institutions will be named in any report or publication from this study. Participation is voluntary, and you may decide to end your participation in the study at any time. All individuals providing data will remain anonymous. This study was reviewed by the UNC-Chapel Hill Office of Human Research Ethics (IRB), which determined that the project was exempt.

- ○ I acknowledge that I have read the informed consent and agree to participate in this research study.
- ○ I am an AHEC team member completing the survey for a participant. I reviewed verbal consent from the participant during an interview, who agreed to participate in the study.

Please carefully read and answer each question as you reflect on your experiences, observations, and perspectives as a health care leader. For each item, provide the best answer(s) by choosing from a list of possible options provided, or by typing your response in specific sections provided in the survey.

If you have questions or technical issues, please contact a member of the study team: Dr. Allie Tran (aktran@email.unc.edu) or Dr. Cheryl Jones (cabjones@email.unc.edu).

Start of Block: Facility/participant info

ID1 **Survey Respondent Information** (this information will remain confidential and will be maintained only in case survey follow up is needed)**:**

- ○ Name _____
- ○ Email _____
- ○ Phone number _____

ID2 **Organization Information:**

- ○ Name _____
- ○ Address, County, Zip Code, State: _____

Start of Block: Organizational characteristics

Q1 **Type of Setting.** Please select one of the following setting types that best describes the primary organization for which information is being reported on:

- ○ Rural hospital
- ○ Urban hospital
- ○ Ambulatory surgical center
- ○ Primary care practice
- ○ Specialty care practice
- ○ Home care agency
- ○ Rural health clinic
- ○ Nursing home
- ○ Adult care home
- ○ Group home
- ○ Correctional facility
- ○ Federally qualified health center
- ○ Health Department
- ○ Other residential care facility

Q3 **This hospital is:**

- ☐ Part of a health care system
- ☐ A critical access hospital
- ☐ A teaching hospital
- ☐ An academic medical center (main campus of hospital is affiliated with a medical school)
- ☐ A non-teaching, community hospital
- ☐ Other _____

Q4 **Does your organization have patient beds designated as inpatient, overnight stay?**

- ○ Yes
- ○ No

Q5 **Number of licensed and operating patient beds** (enter "0" if there are none)**:** _____

Q6 **For organizations with overnight patient stays, please provide the average number of patient days (in 24-hour days):**

- ○ Between January 1, 2019 and December 31, 2019: _____
- ○ Between January 1, 2020 and June 30, 2020: _____

Q7 **Type of staff employed at or working as part of your organization's health care workforce.** Select all that apply**:**

- ☐ Physicians/hospitalists
- ☐ Physician assistants
- ☐ Medical assistants
- ☐ RNs
- ☐ LPNs
- ☐ Clinical nurse specialists
- ☐ Nurse practitioners
- ☐ Nurse midwives
- ☐ Nurse anesthetists
- ☐ Nursing assistants
- ☐ Paramedics, EMTs
- ☐ Dentists
- ☐ Dental hygienists
- ☐ Lab technologists
- ☐ Radiology technologists
- ☐ Physical therapists
- ☐ Occupational therapists
- ☐ Respiratory therapists
- ☐ Social workers
- ☐ Speech pathologists
- ☐ Audiologists
- ☐ Recreational therapists
- ☐ Ancillary staff (e.g., cafeteria staff, clerical)
- ☐ Housekeeping (Environmental Services)
- ☐ Pharmacists
- ☐ Pharmacy technologists
- ☐ Psychologists and behavioral health counselors
- ☐ Community health workers
- ☐ Medical interpreters
- ☐ Other, please specify: _____

Q8 **Does your facility provide outpatient services?**

- ○ Yes
- ○ No

Q9 **For outpatient service facilities, please enter the average number of patient visits per day:**

- ○ Between January 1, 2019 and December 31, 2019: _____
- ○ Between January 1, 2020 and June 30, 2020: _____

Q10 **Percent of facility's patients covered by the following types of insurance** (approximations are fine; enter 0 if not applicable or unknown**):**

- ○ Uninsured _____
- ○ Medicaid _____
- ○ Medicare _____
- ○ Tricare _____
- ○ Privately Insured _____
- ○ Other _____

Q11 **Percent of facility's patients from the following racial and ethnic backgrounds** (approximations are fine; enter 0 of not applicable or unknown)**:**

- ○ White _____
- ○ Black or African American _____
- ○ American Indian or Alaska Native _____
- ○ Asian _____
- ○ Native Hawaiian or Pacific Islander _____
- ○ Other _____

Start of Block: Impact on communities with pre-existing workforce shortages

The following questions ask you to reflect on the impact of the COVID-19 pandemic on the community where your organization is geographically located. Some questions ask you to reflect on your observations of the workforce at the beginning of the COVID-19 pandemic, on or about March 2020. Other questions ask you to share your observations of the workforce, as it currently exists.

Q12 **Did the community where your organization is geographically located have a pre-existing health care workforce shortage at the beginning of the COVID-19 pandemic?**

- ○ Yes
- ○ No
- ○ Don't know

Q13 **Please indicate the status of your community's supply of health care workers at the beginning of the COVID-19 pandemic, and currently.** Please complete each row.

	Community had short supply at **the beginning** of the COVID-19 pandemic	Community **currently** has short supply	Not in short supply	Don't know
Physicians/hospitalists	☐	☐	☐	☐
Physician assistants	☐	☐	☐	☐
Medical assistants	☐	☐	☐	☐
RNs	☐	☐	☐	☐
LPNs	☐	☐	☐	☐
Clinical nurse specialists	☐	☐	☐	☐
Nurse practitioners	☐	☐	☐	☐
Nurse midwives	☐	☐	☐	☐
Nurse anesthetists	☐	☐	☐	☐
Nursing assistants	☐	☐	☐	☐
Paramedics, EMTs	☐	☐	☐	☐
Dentists	☐	☐	☐	☐
Dental hygienists	☐	☐	☐	☐
Lab technologists	☐	☐	☐	☐
Radiology technologists	☐	☐	☐	☐
Physical therapists	☐	☐	☐	☐
Occupational therapists	☐	☐	☐	☐
Respiratory therapists	☐	☐	☐	☐
Social workers	☐	☐	☐	☐
Speech pathologists	☐	☐	☐	☐

Audiologists	☐	☐	☐	☐
Recreational therapists	☐	☐	☐	☐
Ancillary staff (e.g., cafeteria staff, clerical)	☐	☐	☐	☐
Housekeeping (Environmental Services)	☐	☐	☐	☐
Pharmacists	☐	☐	☐	☐
Pharmacy technologists	☐	☐	☐	☐
Psychologists and behavioral health counselors	☐	☐	☐	☐
Community health workers	☐	☐	☐	☐
Medical interpreters	☐	☐	☐	☐
Other, please specify	☐	☐	☐	☐

Q14 **Of these types of health care workers, which ones are in greatest shortage in your community?**

_____

_____

Q15 **From your perspective, why do you think the shortages of different health care workers exists in your community**?

_____

_____

Q16 **Is there anything else you would like to tell us about how the COVID-19 pandemic affected your community's preexisting shortages of health care workers? Please share how COVID-19 further affected your workforce.**

_____

_____

Start of Block: Adequacy of health care workforce supply

The next few questions ask about your organization's health care workforce supply related to the pandemic. Some questions ask you to reflect on your observations of the workforce at the beginning of the COVID-19 pandemic, on or about March 2020. Other questions ask you to share your observations of the workforce, as it currently exists.

Q17 **How would you describe the overall adequacy of your organization's supply of health care workers at the beginning of COVID-19?**

- ○ Surplus – we had more than enough health care workers at the beginning of COVID-19 to meet staffing needs
- ○ Just about right – supply and demand were in balance at the beginning of COVID-19
- ○ Minor shortage – somewhat difficult to meet staffing needs and fill vacancies
- ○ Consistent shortage – we had ongoing difficulty in meeting staffing needs and filling vacancies

Q18 **In general, how would you describe the current adequacy of your organization's supply of health care workers to respond to the COVID-19 pandemic?**

- ○ Surplus – we have more than enough health care workers available to meet current needs
- ○ Just about right – supply and demand is currently in balance
- ○ Minor shortage – somewhat difficult to meet staffing needs and fill staff vacancies
- ○ Consistent shortage – we have ongoing difficulties in meeting our staffing needs and filling vacancies

Q19 **In general, how does your organization's current health care worker supply compare to the supply at the beginning of the COVID-19 pandemic?**

- ○ Better
- ○ No change
- ○ Worse

Q20 **Please indicate the status of your organization's health care worker supply at the beginning of the COVID-19 pandemic, and currently.** Please complete each row.

	Organization had short supply at **the beginning** of the COVID-19 pandemic	Organization has short supply currently	Not in short supply	Not applicable, don't know
Physicians/hospitalists	☐	☐	☐	☐
Physician assistants	☐	☐	☐	☐
Medical assistants	☐	☐	☐	☐
RNs	☐	☐	☐	☐
LPNs	☐	☐	☐	☐
Clinical nurse specialists	☐	☐	☐	☐

Nurse practitioners	☐	☐	☐	☐
Nurse midwives	☐	☐	☐	☐
Nurse anesthetists	☐	☐	☐	☐
Nursing assistants	☐	☐	☐	☐
Paramedics, EMTs	☐	☐	☐	☐
Dentists	☐	☐	☐	☐
Dental hygienists	☐	☐	☐	☐
Lab technologists	☐	☐	☐	☐
Radiology technologists	☐	☐	☐	☐
Physical therapists	☐	☐	☐	☐
Occupational therapists	☐	☐	☐	☐
Respiratory therapists	☐	☐	☐	☐
Social workers	☐	☐	☐	☐
Speech pathologists	☐	☐	☐	☐
Audiologists	☐	☐	☐	☐
Recreational therapists	☐	☐	☐	☐
Ancillary staff (e.g., cafeteria staff, clerical)	☐	☐	☐	☐
Housekeeping (Environmental Services)	☐	☐	☐	☐
Pharmacists	☐	☐	☐	☐
Pharmacy technologists	☐	☐	☐	☐
Psychologists and behavioral health counselors	☐	☐	☐	☐
Community health workers	☐	☐	☐	☐
Medical interpreters	☐	☐	☐	☐
Other, please specify	☐	☐	☐	☐

Q21 **Of your organization's health care workers in short supply, which ones are in shortest supply?**

_____

_____

Q22 **In each of the specialty areas listed below, please indicate the status of your organization's health care worker supply at the beginning of the COVID-19 pandemic, and currently.** Please complete each row.

	In short supply at the **beginning** of COVID-19	**Currently** in short supply	Not in short supply	Not applicable, don't know
Critical Care	☐	☐	☐	☐
Emergency Care	☐	☐	☐	☐
General Medical/Surgical	☐	☐	☐	☐
Primary Care	☐	☐	☐	☐
Public Health	☐	☐	☐	☐
Behavioral Health/Psychiatry	☐	☐	☐	☐
Maternal and Newborn Health	☐	☐	☐	☐
Pediatrics	☐	☐	☐	☐
Geriatrics	☐	☐	☐	☐
Employee Health	☐	☐	☐	☐
Other, please specify:	☐	☐	☐	☐

The following questions ask about strategies used by your organization to address health care workforce supply during COVID-19.

Q23 **Please rate the effectiveness of the following measures, if used, to support or bolster your organization's health care workforce supply in response to COVID-19.**

	Not effective at all	Slightly effective	Moderately effective	Very effective	Extremely effective	Not used
Premium pay for overtime, working extended shifts, or hazard pay	○	○	○	○	○	○
Internal supplemental staffing, such as per diem staff	○	○	○	○	○	○
Floating staff to other units and departments	○	○	○	○	○	○
External supplemental staffing, such as locum tenens or travel nurses	○	○	○	○	○	○
Changes to speed up hiring and onboarding processes	○	○	○	○	○	○

Cross-training health workers to practice in specialties/departments outside of their “home” work unit	○	○	○	○	○	○
Implementing new or enhancing employee wellness and resilience programs	○	○	○	○	○	○
Closing beds	○	○	○	○	○	○
Diverting patients to other organizations	○	○	○	○	○	○
Other, please specify:	○	○	○	○	○	○

Q24 **Please rate the extent to which each of the following barriers negatively affected your organization’s ability to readily deploy <u>health care workers</u> to needed areas during COVID-19:**

	No effect at all	Slight negative effect	Moderate negative effect	Severe negative effect	Not applicable, or don't know
Onboarding health sciences students (e.g., medical, nursing, other health professional)	○	○	○	○	○
Hiring and onboarding newly graduated or licensed health professionals (e.g., medical, nursing, other health professional graduates)	○	○	○	○	○
Onboarding inactive MDs/nurses/other professionals to return to practice	○	○	○	○	○
Meeting licensure requirements for physicians, advanced practice providers, and other health professionals	○	○	○	○	○
Restrictive position descriptions, job responsibilities, etc.	○	○	○	○	○
Delays in hiring processes and other HR issues, please specify:	○	○	○	○	○
Inadequately trained staff in areas of need (e.g., caring for patients with respiratory problems, on ventilators, in critical care)	○	○	○	○	○
Inadequate PPE supply	○	○	○	○	○
Other, please specify:	○	○	○	○	○

Q25 **In what ways were your organization's health care workers affected by any operational changes that were made during COVID-19?** Select all that apply**:**

- ☐ Employees were called off from work and shifts, and/or required to take PTO
- ☐ Employees were called into work and/or required to take extra shifts
- ☐ Paychecks were delayed or missed
- ☐ Some staff were furloughed. Please list furloughed staff types: _____
- ☐ Some staff were terminated. Please list terminated staff types: _____
- ☐ Staff were stressed, burned out, and/or morale declined
- ☐ Productivity decreased
- ☐ Other, please specific: _____
- ☐ Operational changes had no effect on health care workers
- ☐ No operational changes were made

Q26 **Did health care workers leave your organization during COVID-19?** Select all that apply**.**

- ☐ Yes, some left for personal/family health concerns
- ☐ Yes, some left for child or elder care concerns
- ☐ Yes, some left to take a different job in a different organization
- ☐ Yes, some left after being furloughed
- ☐ Yes, some left for other reasons. Please describe: _____
- ☐ No health care workers left the organization during COVID-19

Q27 Is there anything else you would like to tell us about the **adequacy of the health care workforce supply in your organization, or the strategies used to address them,** during the COVID-19 pandemic?

_____
_____

Start of Block: Adequacy of health care workforce supply to address surge

In this section, you are asked about adequacy of the health care workforce supply to address the COVID-19 surge, and your organization's ability to redirect its workforce to meet staffing demands. For the purposes of this survey, "surge" refers to a significant increase in the number of COVID-19 patients in a short period of time, which stresses normal organizational operations.

Q28 **Has your organization experienced a surge of COVID patients this year?**

- ○ Yes
- ○ No
- ○ Don't know or other, please describe: _____

Q29 **On about what date(s) did your organization begin to experience a surge in COVID-19 patients?** Please indicate the **month(s)**, and, if known, the specific **day(s):** _____

Q30 **For about how long did the surge(s) last?** If you have experienced multiple surges, please answer based on the **combined surges:**

- ○ 1 week or less
- ○ Between 1 and 2 weeks
- ○ Between 2 and 4 weeks
- ○ Between 1 and 2 months
- ○ Between 2 and 3 months
- ○ Between 3 and 4 months
- ○ More than 4 months
- ○ Still ongoing
- ○ Other, please specify: _____

Q31 **Please describe your organization's experiences during the surge, and how the surge impacted your health care workforce.**

_____
_____

Q32 **Did your organization shift to a "contingency" or "crisis" staffing plan during the COVID-19 surge?** Contingency staffing strategies are implemented to plan and prepare for mitigating conditions in which staffing shortages are *anticipated*. Crisis staffing plans are implemented to address an *existing* staffing shortage so that the organization can continue providing care.

- ○ Yes, my organization shifted to a contingency staffing plan
- ○ Yes, my organization shifted to a crisis staffing plan
- ○ No, my organization did not shift to a "contingency" or "crisis" staffing plan
- ○ Don't know

Q33 **Beyond those used initially, what surge-specific strategies did your organization introduce to redirect existing health care workforce supply to meet staffing demands? Please also describe the ease with which your organization was able to redirect its health care workforce supply as needed during the surge.**

_____
_____

Q34 **Please describe the overall adequacy of your organization's supply of health care workers to address the COVID-19 patient surge:**

- ○ Surplus – we had more than enough health care workers to meet surge staffing needs
- ○ Just about right – supply and needs were in balance to meet surge staffing needs
- ○ Minor shortage – somewhat difficult to meet surge staffing needs
- ○ Shortage – ongoing difficulty in meeting surge staffing needs

Q35 **What barriers did the organization encounter in meeting surge staffing demands?** Select all that apply**:**

- ☐ Inadequate PPE (e.g., low ratio of PPE to staff)
- ☐ Lack of staff trained in critical care or caring for ventilator patients
- ☐ Challenges with cross-training of staff
- ☐ Staff testing positive or in quarantine for COVID-19 exposure
- ☐ Testing delays for staff clearance to work
- ☐ Reassignment of high risk staff or staff with a high-risk family member
- ☐ Employee burnout
- ☐ Hiring freezes or HR delays
- ☐ Inadequate funding to support needed responses
- ☐ Lack of staff trained in tele-health or virtual care delivery
- ☐ Other, please specify: _____
- ☐ Not applicable

Q36 **How helpful would the following strategies be, if available, to reduce barriers and enable your organization to more readily deploy staff during a future pandemic or health crisis?**

	Not helpful at all	Slightly helpful	Moderately helpful	Very helpful	Extremely helpful	Not applicable, don't know
Dedicated resources to train staff for working in high need areas (e.g., ICUs, other areas)	○	○	○	○	○	○
More flexible practice regulations for physicians, advanced practice providers, dental assistants, and other health professionals	○	○	○	○	○	○
Developing plans for rapidly engaging students for needed support roles	○	○	○	○	○	○
Relaxing visa limitations for internationally educated health workers	○	○	○	○	○	○

Responsibly lift travel bans so health workers can migrate between states to fill vacancies	○	○	○	○	○	○
Reducing state-to-state practice requirements	○	○	○	○	○	○
Supporting PPE manufacturing and efforts to obtain and distribute PPE	○	○	○	○	○	○
Implementing employee well-being and resilience programs, counseling, and/or mental health care access	○	○	○	○	○	○
Increasing supports for personal and family needs	○	○	○	○	○	○
Other, please specify:	○	○	○	○	○	○

Q37 **Is there anything else you would like to tell us about:**

The adequacy of your organization's health care workforce supply to address the COVID-19 surge _____

Your organization's ability to redirect its existing workforce supply to meet staffing demands during the COVID-19 surge _____

The barriers faced in redirecting staff to meet staffing demands during the COVID-19 surge _____

Strategies to eliminate barriers and readily deploy staff in a future pandemic or health crisis _____

Start of Block: Adequacy of health care workforce training

The questions in this section ask you to describe the adequacy of the health care workforce <u>training for responding to the COVID-19 pandemic</u>, and any additional training or cross-training needed by the health care workforce.

Q38 **In your view, how adequately was your health care workforce trained to respond to a pandemic or similar health "crisis" prior to the COVID-19 pandemic?**

- ○ Inadequately trained (no preparation for such events)
- ○ Trained somewhat (had class training, but had never used training)
- ○ Sufficiently trained (class training with some application of training)
- ○ Very well prepared (clear understanding of their roles and responsibilities during such events)

Q39 **Please identify any training or cross-training provided by your organization to members of the health care workforce prior to or during the COVID-19 pandemic.** Check all that apply**:**

- ☐ Screening and testing procedures for COVID-19 in existing or potential patients
- ☐ Managing patients with respiratory diagnoses and developing a treatment plan
- ☐ Managing the care of ventilator patients
- ☐ Providing care to patients in critical care
- ☐ Emergency preparedness
- ☐ Patient triage
- ☐ Public health care
- ☐ Behavioral health access and treatment
- ☐ Chronic conditions
- ☐ General medical/surgical care
- ☐ Self-care, personal wellness, and care of family
- ☐ Other, please specify: _____

Q40 **In your view, what health care workforce training might be needed in the <u>future</u> to respond to a pandemic or similar health crisis in the future?** Select all that apply**:**

- ☐ Screening and testing procedures in existing or potential patients
- ☐ Managing patients with respiratory diagnoses and developing a treatment plan
- ☐ Managing the care of ventilator patients
- ☐ Providing care to patients in critical care
- ☐ Emergency preparedness
- ☐ Patient triage
- ☐ Public health care
- ☐ Behavioral health access and treatment
- ☐ Chronic conditions
- ☐ General medical/surgical care
- ☐ Palliative care or grief counseling
- ☐ Self-care and personal wellness
- ☐ Other, please specify: _____

Q41 **Is there anything else you would like to tell us about the adequacy of training, and additional training or cross-training needs of the health care workforce to respond to a future pandemic or health crisis?**

_____

_____

Start of Block: Impact of PPE availability

The next set of questions address the impact of personal protective equipment (PPE) availability on the health care workforce.

Q42 **To what extent do you agree with the following statements:**
(Please note: appropriate PPE refers to N95 respirators, gloves, gowns, and face shields).

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Not applicable
At the start of COVID-19, our organization had an adequate supply of appropriate PPE for our healthcare workers.	○	○	○	○	○	○
At the start of COVID-19, our organization had adequate, rapid access to additional PPE for our healthcare workers.	○	○	○	○	○	○
Currently, our organization has an adequate supply of appropriate PPE for our healthcare workers.	○	○	○	○	○	○
Currently, our organization has rapid access to appropriate PPE for our healthcare workers.	○	○	○	○	○	○
In the future, I expect our organization will have an adequate supply of appropriate PPE for our healthcare workers.	○	○	○	○	○	○
In the future, I expect that our organization will have rapid access to appropriate PPE for our healthcare workers.	○	○	○	○	○	○

Q43 **To address any concerns about PPE supply during COVID-19, which of the following strategies did your organization implement to expand PPE supply?**

	Yes	No
Rationing of N95 masks	○	○
Reuse of N95 masks	○	○
Rationing of other types of masks	○	○

Rationing of gowns	○	○
Reuse of gowns	○	○
Rationing of eye shields	○	○
Workflow changes to minimize enter/exit of patient rooms	○	○
Adding negative pressure rooms	○	○
Other, please specify	○	○

Q44 **If your organization asked staff to reuse N95 or other types of masks to expand PPE supply, what was your organization's policy on the number of times a single mask could be reused?** _____

Q45 **How was PPE distributed to and prioritized among patients, members of the health care workforce, visitors, and various departments in your organization?**

_____

_____

Q46 **Is there anything else you would like to tell us about the impact of PPE availability on the health care workforce?**

_____

_____

Start of Block: Sufficiency of support mechanisms for health care workforce

For the following questions, please reflect on the sufficiency of support mechanisms for the health care workforce, including the availability of child care, transportation, mental health and resilience support services, and other support items during COVID-19.

Q47 **Please rate the extent to which health care workers expressed concerns in each of the following areas during COVID-19:**

	Not at all concerned	Slightly concerned	Moderately concerned	Very concerned	Extremely concerned
Childcare					
Elder care					
Transportation					

Taking breaks or preparing meals for themselves and family	
Acquiring food and supplies for themselves and family	
Access to mental health/behavioral health counseling	
Preventing burnout, promoting wellness	
Housing for staff and/or family	
Fear of exposing themselves, other staff, family, and friends	
Personal safety and the safety of other staff, family, and friends	
Other, please specify:	

Q48 **From the list below, please identify the support services your organization <u>provided</u> to the health care workforce and those that were <u>used</u> by members of the health care workforce during COVID-19.**

	Provided by the organization	Used by the workforce
Childcare services	☐	☐
Options to care for elderly family members	☐	☐
Transportation services	☐	☐
Extra staff for staff to take breaks and have meals	☐	☐
Adequate time off to meet personal and family needs	☐	☐
Counseling services	☐	☐
Housing for staff and/or family	☐	☐
Resiliency training	☐	☐
Other, please specify:	☐	☐

Q49 **In general, how sufficient were the support services your organization provided relative to the needs of your health care workforce during COVID-19?**

- ○ We adequately provided the support services needed to address the concerns of our healthcare workforce.
- ○ We provided most of the support services needed to address the concerns of our healthcare workforce.
- ○ We provided a few of the support services needed to address the concerns of our healthcare workforce.
- ○ We were unable to sufficiently provide support services to address the concerns of our healthcare workforce.
- ○ Other, please describe: _____

Q50 **What additional supports will be needed to better meet the needs of your health care workforce in a future pandemic?**

_____
_____

Q51 Is there anything else you would like to tell us about the **sufficiency of support mechanisms for the health care workforce during COVID-19?**

_____
_____

Start of Block: Impact of postponing or eliminating nonessential services and procedures

The following questions pertain to the impact of COVID-19 on the delivery of health care, including "nonessential" services and procedures, on your organization, its healthcare workforce, and your community. For the purposes of this study, nonessential health care services are patient treatments, procedures, therapies, and other services that your organization deemed unnecessary to deliver during COVID-19.

Q52 **Did your organization temporarily suspend, postpone, interrupt, or eliminate the provision of any nonessential health care services and procedures to patients due to COVID-19?**

- ○ Yes
- ○ No
- ○ Not applicable

Q53 **Which services and procedures did your organization suspend, postpone, interrupt, or eliminate due to COVID-19, and for what length of time?**

	Suspended for 1 week or less	Suspended for 2-4 weeks	Suspended for 1-2 months	Suspended for 2 or more months	Suspended indefinitely	Not applicable
Elective surgeries	○	○	○	○	○	○
Outpatient surgeries	○	○	○	○	○	○
Dental procedures	○	○	○	○	○	○
Radiology imaging	○	○	○	○	○	○
Transplants	○	○	○	○	○	○
Chemotherapy	○	○	○	○	○	○
Outpatient rehabilitation services	○	○	○	○	○	○
Other, please specify	○	○	○	○	○	○
Other, please specify	○	○	○	○	○	○

Q54 **How did suspending, postponing, interrupting, or eliminating the delivery of nonessential services affect your organization during COVID-19?** Select all that apply**:**

- ☐ Lost revenue/financial losses
- ☐ Furloughed or terminated staff
- ☐ Diverted patients to other organizations, practices, or offices temporarily; please specify the length of time _____
- ☐ Closed beds, practices or offices temporarily; specify the length of time _____
- ☐ Closed beds, practices or offices permanently
- ☐ Shifted to tele-health, virtual care delivery
- ☐ Temporarily suspended the offering of certain programs or services, please specify the programs or services suspended _____
- ☐ Stopped offering certain programs or services altogether; please specify the programs or services stopped _____
- ☐ Changed other organizational practices; please describe: _____
- ☐ The population of patients served changed; please describe how your patient population changed: _____
- ☐ Other, please specify: _____
- ☐ COVID-19 had no effect on the delivery of "nonessential" services by my organization

Q55 **How did your organization's suspension, postponement, interruption, or elimination** of nonessential services and procedures affect the organization's health care workforce? Please describe.

_____
_____

Q56 **What health care services did the people in your community delay, overlook, or omit seeking** altogether during the COVID-19 pandemic? Select all that apply:

- ☐ None
- ☐ Primary care
- ☐ Care for chronic conditions (diabetes, hypertension)
- ☐ Vaccinations
- ☐ Well child visits
- ☐ Prenatal/maternity care
- ☐ Dental care
- ☐ Urgent care
- ☐ Elective surgeries
- ☐ Recommended or needed surgeries
- ☐ Care for cardiovascular symptoms (e.g., chest pain)
- ☐ Care for stroke-like symptoms
- ☐ Cancer diagnosis and care
- ☐ Behavioral health services
- ☐ Other, please specify: _____
- ☐ Other, please specify: _____

Q57 **Is there anything else you would like to tell us about how interruptions in the delivery of routine health care during the COVID-19 pandemic affected your organization, its workforce, or the people/citizens in the community where your organization is geographically located? Please also include any reflections you may have about how patients' delay or omission in seeking care affected the community, your organization, and its workforce.**

_____
_____

Start of Block: Support to resume health care delivery to pre-pandemic levels

The following questions ask you to reflect on your organization's plans to resume health care delivery to pre-pandemic levels.

Q58 **Is your organization or practice planning to resume any previously offered services that were considered to be nonessential, suspended, postponed, or discontinued during COVID-19?**

- ○ Yes
- ○ No
- ○ Don't know

Q59 **Which services suspended, postponed, or discontinued during COVID-19 will your organization resume or consider resuming? Please address why you plan to resume.**

_____
_____

Q60 **Given current resources, to what level do you anticipate resuming these services by June 30, 2021?**

- ○ To a level above pre-COVID
- ○ About the same level as pre-COVID
- ○ To a level below pre-COVID

Q61 **Which services that were suspended, postponed, or discontinued during COVID-19 will <u>not</u> be resumed, and why?**

_____
_____

Q62 **What support does your organization need to resume the delivery of suspended services to pre-pandemic levels?** Please explain why your organization will need support to resume these services to pre-pandemic levels.

_____
_____

Q63 **Is there anything else you would like to tell us about supports needed to resume suspended health care service delivery to pre-pandemic levels?**

_____
_____

Start of Block: Impact on behavioral health services

The following questions ask you to reflect on the impact of COVID-19 on the delivery of behavioral health services in your community. Behavioral health focuses on the promotion of mental health; resilience and wellbeing; the treatment of mental and substance use disorders;

and the support of patients, along with their families and communities, who experience and/or are in recovery from these conditions.

Q64 **In your view, how has the demand for behavioral health services changed in your community due to COVID-19**? Which specific behavioral health services were most needed?

_____
_____

Q65 **Describe how COVID-19 has affected the delivery of behavioral health services by your organization?**

_____
_____

Q66 **How has COVID-19 affected your organization's behavioral health care workforce and this workforce's needs?**

_____
_____

Q67 **Is there anything else you would like to tell us about the delivery of behavioral health services in your organization and the impact on the health care workforce?**

_____
_____

Start of Block: Ability of telehealth options to deliver care; impact of telehealth on orgs

The next series of questions asks you about the use of telehealth in your organization during the COVID-19 pandemic, and your organization's experiences using telehealth options to deliver routine, emergent, and behavioral health care services to patients.

Q68 **How was telehealth used in your organization to deliver health care services prior to the COVID-19 pandemic?** Select all that apply**:**

- ☐ For providing routine care, please specify type of care: _____
- ☐ For providing emergency or emergent health care, please specify: _____
- ☐ For providing behavioral health care
- ☐ For providing other health services, please specify the services: _____
- ☐ We did not use telehealth before COVID-19

Q69 **Did you expand telehealth options for delivering health care services to patients during the COVID-19 response?**

- ○ Yes
- ○ No

Q70 **Did you implement telehealth options for the first time to deliver health care services to patients during COVID-19?**

- ○ Yes
- ○ No

Q71 **What steps did your organization take to implement and/or expand telehealth during the COVID-19 pandemic? To provide which services?**

_____

_____

Q72 **Based on your organization's experiences, please rate the effectiveness of using telehealth to deliver health care services during COVID-19 in the following areas:**

	Not effective at all	Slightly effective	Moderately effective	Very effective	Extremely effective	Not applicable
Delivering routine health care to patients	○	○	○	○	○	○
Delivering emergency or emergent health care to patients	○	○	○	○	○	○
Delivering routine behavioral health care to patients	○	○	○	○	○	○
Delivering emergency or emergent behavioral health care to patients	○	○	○	○	○	○

Q73 **How has telehealth benefitted your organization during its response to COVID-19?**

_____

_____

Q74 **How has telehealth challenged your organization during its response to COVID-19?**

_____

_____

Q75 **How has telehealth impacted your organization's health care workforce?**

_____

_____

Q76 **What patient care needs and concerns do you think are <u>best</u> addressed by telehealth?**

_____
_____

Q77 **What patient care needs and concerns do you think <u>are not</u> well addressed by telehealth?**

_____
_____

Q78 **Is there anything else that you would like to tell us about the use of telehealth options to deliver routine, emergent health, and/or behavioral health care services to patients, or the impact of using telehealth on your organization and its health care workforce?**

_____
_____

Start of Block: Ability to meet needs of minority populations, health disparities, health risks

The following questions ask about the ability of the health care workforce and health care delivery structure to meet the needs of vulnerable populations during the COVID-19 pandemic. For the purposes of this study, "vulnerable populations" means individuals and groups who, because of their age, race, ethnicity, income, employment status, living arrangements, or other personal characteristics, are at increased risk of exposure to COVID-19 and/or to subsequent illness or co-morbidities. These individuals and groups may also have limited access to care.

Q80 **Please describe the steps your organization took to prepare the health care workforce to respond to the needs of minority populations, populations subject to health disparities, and populations with increased health risks during the COVID-19 pandemic.**

_____
_____

Q81 **In your view, please rate the ability of your organization's <u>health care workforce</u> to respond to the health care needs of the following vulnerable populations during the COVID-19 pandemic:**

	Unable	Slightly able	Moderately able	Able	Very able	Not applicable
Black or African American populations	○	○	○	○	○	○
Hispanic or LatinX populations	○	○	○	○	○	○

Undocumented immigrant populations	○	○	○	○	○	○
Non-English speakers	○	○	○	○	○	○
Uninsured or underinsured individuals	○	○	○	○	○	○
Low income populations	○	○	○	○	○	○
Older adults	○	○	○	○	○	○
Children	○	○	○	○	○	○
Incarcerated and formerly incarcerated populations	○	○	○	○	○	○
Homeless populations	○	○	○	○	○	○
Intellectually or developmentally disabled individuals	○	○	○	○	○	○
Other, please specify	○	○	○	○	○	○
Other, please specify	○	○	○	○	○	○

Q82 **Please rate the overall preparedness of your organization's workforce to respond to the needs of vulnerable populations in a future crisis or pandemic:**

- ○ Not prepared
- ○ Slightly prepared
- ○ Moderately prepared
- ○ Prepared
- ○ Very well prepared

Q83 **In your view, which populations in your organization's catchment area will be at greatest health risk in a future pandemic?**

_____

_____

Q84 **Please rate the overall ability of your organization to respond to the needs of these high risk populations in a future crisis or pandemic:**

- ○ Unable
- ○ Slightly able
- ○ Moderately able
- ○ Able
- ○ Very able

Q85 **Based on your organization's experiences during the COVID-19 pandemic, please rate your perception of the ability of North Carolina's healthcare delivery structure to respond to the following populations' needs in a future pandemic:**

	Unable	Slightly able	Moderately able	Able	Very able	Not applicable
Black or African American populations	○	○	○	○	○	○
Hispanic or LatinX populations	○	○	○	○	○	○
Undocumented immigrant populations	○	○	○	○	○	○
Non-English speakers	○	○	○	○	○	○
Uninsured or underinsured individuals	○	○	○	○	○	○
Low income populations	○	○	○	○	○	○
Older adults	○	○	○	○	○	○
Children	○	○	○	○	○	○
Incarcerated and formerly incarcerated populations	○	○	○	○	○	○
Homeless populations	○	○	○	○	○	○
Intellectually or developmentally disabled individuals	○	○	○	○	○	○
Other, please specify	○	○	○	○	○	○
Other, please specify	○	○	○	○	○	○

Q86 Is there anything else you would like to tell us about the **ability of the health care workforce or the health care delivery structure to respond to the needs of minority populations, populations with health disparities, or populations with increased health risks during a pandemic***?*

_____

_____

Start of Block: Impact on current and future students

The next few questions ask you to think about the impact of the COVID-19 pandemic, including PPE availability, on current health sciences students and the implications for future students contemplating a career in a health sciences field.

Q87 **In your view, how has COVID-19 affected <u>current</u> students in the health sciences? Please include any specific issues that pertain to particular groups of health sciences students with whom you are familiar.**

_____

_____

Q88 **What barriers has your organization faced in accepting and/or supporting health care pre-professional students in their clinical experiences and training?**

_____

_____

Q89 **What innovations has your organization introduced to address these barriers?** If your organization did not introduce any innovations, please write "none".

_____

_____

Q90 **In your view, how has COVID-19 affected potential <u>future</u> students who might consider entering a health sciences field? Please include any specific issues that pertain to particular groups of health sciences students with whom you are familiar.**

_____

_____

Q91 **What innovations might be needed to address the needs of <u>future</u> health sciences students? Please include any specific issues that may pertain to a particular group of future health sciences students with whom you are familiar.**

_____

_____

Q92 **Based on what you know about the COVID-19 pandemic and the likelihood of similar events occurring in the future, how likely are you to recommend a career in the health sciences to future students?**

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q93 **Is there anything else you would like to tell us about the impact of the COVID-19 pandemic, including PPE availability, on current health sciences students and students who may be considering a career in a health sciences field in the future?**

_____

_____

Start of Block: Closing

Q94 **Please describe your organization's disaster response plan that was in place <u>prior</u> to COVID-19.** To what extent did your disaster response or other plans anticipate organizational needs during COVID-19? What worked well? What was missing? What did you learn?

_____

_____

Q95 **Please provide any specific suggestions about health care delivery, health care organizations, and the health care workforce during the COVID-19 pandemic that you think is important for the General Assembly to consider as they plan for a future pandemic response:**

_____

_____

Q96 **If there is anything that you would like us to know about the COVID-19 pandemic and its effects on the health care workforce and health care organizations that was not addressed in this survey, please describe here:**

_____

_____

Thank you for being a part of this research study to understand the impact of COVID-19 on the healthcare workforce and healthcare organizations in North Carolina.