

Original Research

Primary Care Practices in Western North Carolina: Adaptation to the COVID-19 Pandemic and Ongoing Challenges

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Abstract

Introduction

The COVID-19 pandemic has created unique challenges for primary care practices while also highlighting their importance in the pandemic response. To understand primary care practice needs, a survey was conducted of practices in Western North Carolina.

Methods

Phase 2 of a primary care needs assessment was administered to 63 practices in Western North Carolina over the course of six weeks, from July 23 to August 31, 2021.

Results

Most practices were operating with normal hours, though some still operated with reduced hours. Many practices reported insufficient personal protective equipment (PPE) supplies. While most practices provided at least some care via telehealth, practices cited different barriers to providing telehealth, with patient technology challenges being the most frequently cited.

Discussion

Practices have adapted to the restrictions of the pandemic, but many are still vulnerable, and the patients they serve may face reduced access to care due to practice limitations or barriers to telehealth. Practices play a critical role in providing care to patients throughout the pandemic and continue to assist in pandemic response by providing COVID-19 testing and other services.

Conclusion

Primary care practices in Western North Carolina continue to provide care to patients and support the overall pandemic response. The pandemic has highlighted the need to include primary care in emergency response efforts. Ongoing work will allow North Carolina to reach practices more effectively in future crises via the newly created NC Responds system, which allows primary care practices to be contacted in the event of a public health emergency.

Keywords

SARS-CoV-2; coronavirus infections; COVID-19; pandemics; primary health care; primary care physicians; needs assessment; delivery of health care

Introduction

On March 11, 2020, the World Health Organization declared the novel strain of coronavirus

(COVID-19) to be a worldwide pandemic.¹ The Executive Office of the President of the United States (US) declared COVID-19 a national emergency on March 13, 2020.² Since this dec-

laration, the pandemic has continued to spread to millions globally with numbers still rising.³ Primary care practices play many roles in the response to COVID-19, such as outpatient evaluation of respiratory illness, maintenance of chronic diseases, behavioral health care and support to prevent hospital admissions. Additionally, primary care practices aid in providing community testing for the virus as many patients will present initially to their trusted primary care doctor for their needs. Therefore, primary care providers are an integral part of the COVID-19 response strategy.⁴

Primary care practices are key to successful emergency response efforts. An illustration of primary care's direct involvement is the John Peter Smith (JPS) Health Network's response to Hurricane Katrina. After several thousand refugees from New Orleans and surrounding areas were moved to Tarrant County, Texas, JPS Health Network physicians mobilized to provide care. Their mobilization prevented a surge in emergency department utilization via their ability to triage patients properly by determining which patients needed immediate inpatient care versus those that could be treated in outpatient settings.⁵ Importantly, following an emergency, many primary care practices experience a post-disaster rise in demand for care that arises when people with chronic conditions defer care.⁶ A similar pattern is emerging in the protracted experience with the COVID-19 pandemic.⁷ Throughout the early stages of the pandemic, primary care practices had to adjust their practice model to continue delivery of both chronic and acute care to their patients.

An estimated 40.9% of US adults (aged >18 years) describe deferring medical care during the pandemic, with 12.0% avoiding emergency care and 31.5% avoiding routine care.⁷ Financial strains have resulted in the closure of many practices, including up to 8% of physician practices nationwide according to one report.⁸ Primary care visits that were traditionally in-person were transitioned to telehealth with varying effectiveness with challenges disproportionately affecting rural and elderly populations.^{9–11} Securing personal protective equipment (PPE) was critical in safely continuing in-person visits.

Our team engaged in an effort to understand the needs of primary care practices in the 16 westernmost counties of North Carolina (WNC) between March 26 and April 21, 2020, (Phase 1 effort) and published these results (Denslow et al.).¹² We then engaged in a similar follow-up needs assessment of this same cohort of practices between July 23 and August 31, 2021 (Phase 2). This current manuscript describes the results of the Phase 2 effort where we included questions to capture the impact of the pandemic over time on primary care service delivery.

Methods

A phone-based outreach to individual primary care practices was conducted. We collected follow-up information on practice operations and included questions asked during our Phase 1 assessment, which allowed for comparisons over time of a cohort with both Phase 1 and Phase 2 responses.

Phase 2 Survey Instrument Development

The Phase 1 needs assessment was developed with input from the staff of the Cecil G. Sheps Center for Health Services Research in Chapel Hill, NC, the Mountain Area Health Education Center (MAHEC) practice support coaches, the University of North Carolina (UNC) Health Sciences at MAHEC survey researchers and the North Carolina Area Health Education Centers leadership. Phase 1 was administered between March 26 and April 21, 2020. The Phase 2 needs assessment was developed with input from the WNC regional response team leadership to further inform the regional team's ongoing response. Both surveys included open- and closed-ended questions, including if practices offered COVID-19 testing, the proportion of their visits held via tele-technologies and if financial challenges existed in providing such services. Further questions included the impact on business hours and an evaluation of PPE supplies. Additionally, we asked about the practice's perceptions of challenges their patients experienced using tele-technologies (see **Supplement 1** for Phase 2 survey/interview guide).

Survey Population

We called all 110 practices that responded to our Phase 1 outreach.¹² These included practices

that provide outpatient family medical care, internal medicine, obstetrics/gynecology and/or pediatric primary care in the 16 counties that make up the MAHEC service area. Of those 110 practices, we obtained data from 63.

Survey Administration and Tracking

Five volunteer interviewers were involved in practice outreach and data collection. Volunteer interviewers were trained in calling and data entry via Zoom (Zoom Video Communications, Inc., San Jose, CA) training sessions. Callers used the web-based survey and tracking system supported by the Sheps Center. As part of the Phase 1 project, the Sheps team developed an emergency alert “red button” feature that allowed for immediate communications with regional team members who would then immediately contact a practice and respond to needs such as securing PPE as well as personnel or COVID-19-related financial assistance. Call volunteers, survey developers and web application programmers participated in regular Zoom “huddles” that allowed for clear communication about common problems arising on calls, enabling quick and consistent messaging and solutions.

Data collectors requested to speak with the practice manager or another staff member knowledgeable about supply availability, training needs and practice protocols. Data collectors attempted contact with practices up to two times a week over the course of six weeks from July 23 and August 31, 2021. Contact attempts were kept at least 48 hours apart and were made at different times of day (morning and/or afternoon) and different days of the week. Forty-six practices did not respond to calls, a few (3) refused to participate and two practices, which were members of larger healthcare networks, referred callers to their flagship medical facility for survey completion.

Survey data were analyzed using Stata 16 (StataCorp, LLC, College Station, TX) and, due to the nature of the information collected, we conducted only descriptive analyses. The study was determined to be non-human subjects research by the Institutional Review Board of UNC, Chapel Hill.

Results

Table 1 provides descriptive information about the practices surveyed. The practices were primarily small, with 20 out of 63 having only a single full-time physician. Fifteen out of 63 had at least five physicians on staff, and one practice was led by a nurse practitioner (NP). More than half the practices (34) employed at least one NP or a physician’s assistant (PA). Approximately 40% (25) of the practices were located in rural counties as defined by the Rural Urban Commuting Area (RUCA) codes.¹³ Among the respondents, 56% (35) were independent practices and 8% (5) were safety-net practices (FQHCs, rural health clinics and free clinics). Practices with specialties of family medicine and internal medicine were combined into the category of primary care.

Our data found that practices had adapted to the pandemic circumstances. Compared to responses in the Phase 1 effort, more practices were operating with full hours, were confident in their PPE supplies and were providing a greater proportion of their visits face-to-face. More practices also offered testing for COVID-19. Despite these successes, we also found several areas where practices still faced challenges to operating normally and to providing safe, high-quality care to their patients.

Practice Operations

Despite the challenges of the pandemic, 53 practices were open with regular business hours while the rest reported being open with reduced hours. This outcome represents a significant increase from the first phase where only 26 practices (out of 110) reported being open with regular hours, and an additional 14 reported being open with reduced hours. Practices were also functioning relatively normally despite the limits of the pandemic, as practices reported that on average 75% of their visits were face-to-face with the rest occurring over the phone or via video. Less than 25% of all practices were conducting more than half of their visits over telephone or video, and at least 10% were providing almost exclusively (>98%) face-to-face visits. Practices have also seen a significant increase in the availability of COVID-19 testing, with 73% reporting that they offer testing compared with the 43% that reported that they offered COVID-19 testing during Phase 1.

Table 1. Characteristics of Surveyed Practices

	Total (N=63)	Urban (N=38)	Rural (N=25)
Number of Physicians in Practice	N (%)	N (%)	N (%)
0	1 (1.9)	0 (0.0)	1 (4.4)
1	20 (37.7)	8 (26.7)	12 (52.2)
2-4	17 (32.1)	9 (30.0)	8 (34.8)
5 or more	15 (28.3)	13 (43.3)	2 (8.7)
Non-Physician Providers	Mean (STD)	Mean (STD)	Mean (STD)
Total NP and PAs	1.4 (1.8)	1.6 (2.0)	1.1 (1.6)
Practice Type	N (%)	N (%)	N (%)
FQHC/Rural Health Clinic	2 (3.2)	1 (2.6)	1 (4.0)
Free Clinic	3 (4.8)	2 (5.6)	1 (4.0)
Health Department	4 (6.4)	1 (2.6)	3 (12.0)
Independent practice	35 (55.6)	23 (60.5)	12 (48.0)
System-owned	10 (15.9)	7 (18.4)	3 (12.0)
Other/Unknown	9 (14.3)	4 (10.5)	5 (20.0)
Practice Specialty	N (%)	N (%)	N (%)
OB/GYN	5 (7.9)	5 (13.2)	0 (0.0)
Pediatrics	11 (17.5)	7 (18.4)	4 (16.0)
Primary Care	47 (74.6)	26 (68.4)	21 (84.0)

In addition to increasing hours of operations and offering more testing, providers were also more confident in their PPE supplies. **Figure 1** describes shortages of different types of PPE among practices. Of the 63 practices that responded to both Phase 1 and Phase 2 surveys, in Phase 1, roughly half (26–38 practices) reported not having enough staff gowns, N95 respirators, face shields, surgical masks and/or hand sanitizer for the next four weeks. In Phase 2, 11–26 practices reported similar shortages. The most pressing need was N95 respirators, with 38 practices reporting a need. In Phase 2, practice need decreased across all categories of PPE except for single-use gloves. N95 respirators were still the greatest concern, though only 26 practices reported not having enough for the next four weeks.

Despite the shift of many practices to more normal operations, many of these practices still reported challenges. Although the majority of visits across all practices were being conducted face-to-face, telehealth played a critical role in most of their practice models. The transition to

telehealth was challenging for the vast majority of practices in the cohort with patient-level challenges being the most commonly noted barrier. **Figure 2** displays the number of practices that reported difficulty with select aspects of providing telehealth to their patients. Practices reported that many patients continued to prefer face-to-face visits. A smaller yet significant number of practices reported additional difficulties, such as insufficient internet bandwidth, insurers denying payments and concerns about the future overhead costs for delivering telehealth services. Some practices had changed their telehealth service vendors, with 23 practices stating that they had changed telehealth platforms over the course of the pandemic.

A return to regular business hours has likely stabilized many of these practices, but lower patient volume may still be affecting the financial health of the practices as they continue to see fewer patients. **Table 2** shows that more than half (32 out of 63) reported that they were seeing lower patient volume, with 35%

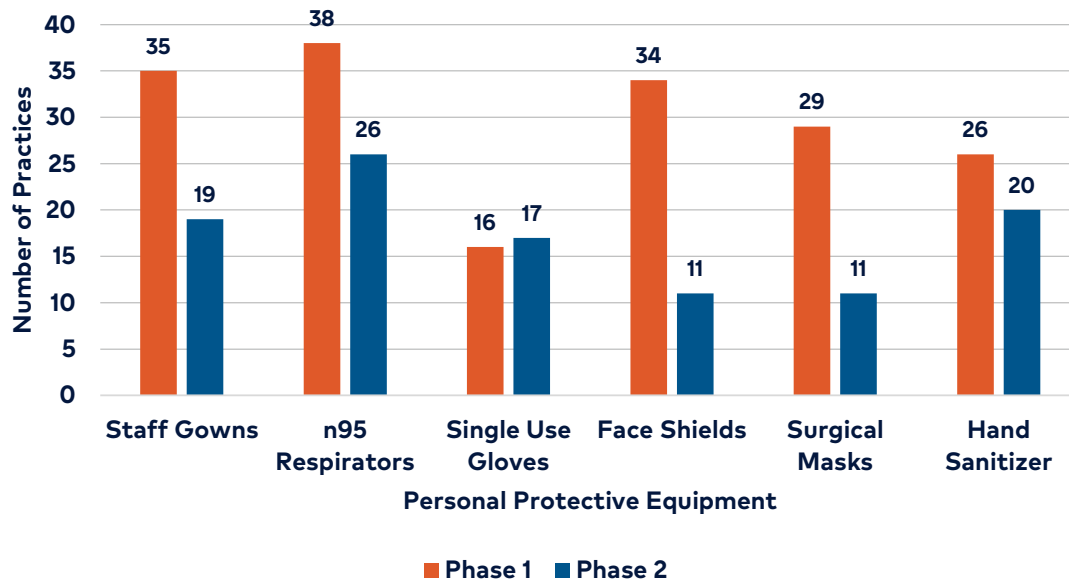


Figure 1. Practices with inadequate supply* of personal protective equipment.

*Inadequate supply is defined as not having enough equipment for the next four weeks.

reporting at least a 10% drop in volume and 6% reporting at least a 40% decline. Nevertheless, 11 practices actually reported an increase in patient volume, with 7 of those practices stating they had seen an increase of at least 10%, indicating that some practices had successfully adapted to the restrictions and needs of the pandemic.

Moving forward, almost all of the practices surveyed expressed interest in participating in a statewide emergency response system, which

would allow them to be contacted to coordinate response and assess needs during future emergencies. They also indicated that they would be willing to follow up yearly in order to maintain current contact information.

Discussion

Thus far, the results show that practices have stabilized since the onset of the pandemic; however, there are still areas of concern. The practices surveyed are small on average, and the 20 practices with only one full-time physi-

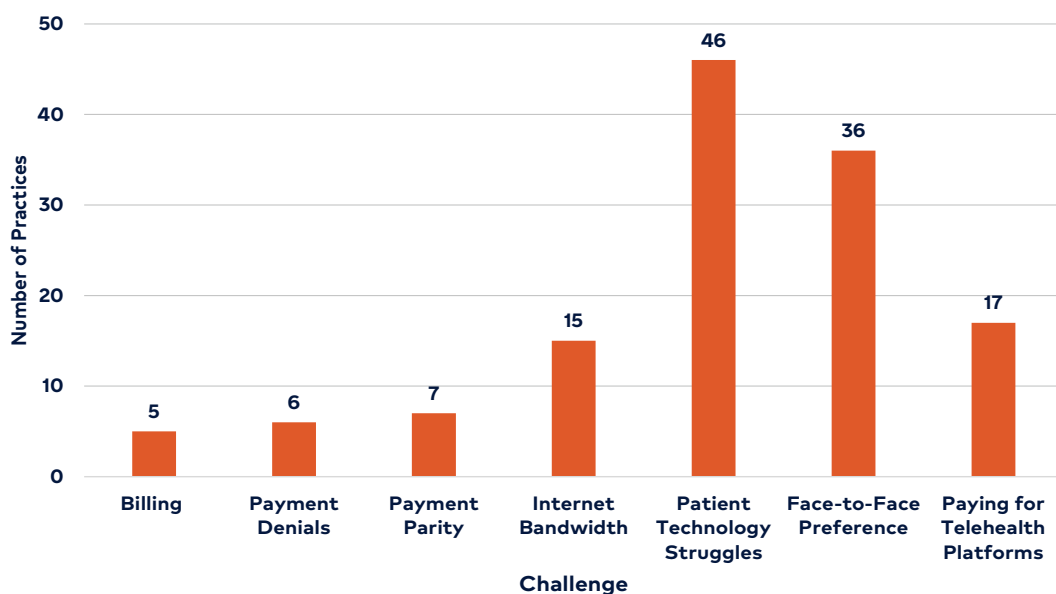


Figure 2. Practice-reported challenges to providing telehealth services.

Table 2. Change in Practice Volume (Compared to Pre-Pandemic Levels)

	Any Change	≥10% Change	≥40% Change
Higher	11	7	0
Lower	32	22	4
Total	43	29	4

cian on staff are vulnerable as the inability of the physician to work due to illness or other circumstances could temporarily or permanently close the practice altogether. Given that many of these practices are located in rural areas, access to alternative sources of care may be limited for patients in the region and residents may face a decline in health care access. The financial impacts of the pandemic could also threaten the financial viability of some of the practices if patient volume remains reduced. Telehealth can offset some of the loss of face-to-face visits, but many practices are still adjusting to telehealth, and healthcare stakeholders realize that without a long-term plan for parity in associated payments, practices may not be able to continue to operate their businesses. In rural areas with a paucity of broadband infrastructure and an older population, challenges in accessing care may increase. In pandemics like COVID-19, these are the very people that should not be expected to leave their homes to travel to receive care due to their increased risk of exposure. The literature suggests that some of those in rural areas who face limitations in broadband access often require the most care due to a higher chronic disease burden.^{10,11} The results of our survey identified patient challenges with using tele-technologies as one of the largest barriers, and indicated a need to enhance literacy in being able to use tele-technologies and invest in broadband infrastructure.

Our results suggest that primary care practices have continued to adapt their operations as the COVID-19 pandemic progressed in WNC. While primary care practices play an important role during disasters and emergencies, the length and scope of the COVID-19 pandemic have required practices to approach their operations differently than in shorter-term emergencies like weather-related natural disasters. Practices will need to adapt to the long-term impacts of the disease such as chronic conditions related to COVID-19 infection.

Other states and organizations have implemented similar needs assessments and developed primary care practice networks. The University of Colorado Department of Family Medicine operates the State Networks of Ambulatory Practices and Partners (SNOCAP), which coordinates practice-based research networks (PBRNs).¹⁴ To assist the state in addressing and responding to COVID-19, SNOCAP publishes regular online reports outlining survey results related to practice financial status, testing resources, contact tracing and telehealth abilities, in easy-to-read infographic formats. They also provide e-resources and have launched an online video series addressing pressing issues. Similarly, the Primary Care Collaborative (PCC) in partnership with the Larry A. Green Center has been administering weekly national surveys since March 13, 2020, to primary care practices in order to assess ongoing needs and provide resources and support to primary care practices.¹⁵

One important outcome of the Phase 1 and Phase 2 efforts was to gain a greater understanding of the challenges in North Carolina with having rapid access to accurate contact information for primary care practices that is needed in order to assess and address needs quickly. As such, the Sheps and MAHEC team developed the NC Responds system (<https://ncresponds.unc.edu>). In July of 2020, the Sheps Center received funding from the North Carolina Area Health Education Centers (NC AHEC) to create an emergency response system that enables the State of North Carolina (or other approved entities) to deploy an email-based needs assessment to health care practices of any specialty (including pharmacies and health departments) within 72 hours or an email announcement within 24 hours during a declared state of emergency. A web-based tracking system is used to define a cohort of practices intended for a specific response that can provide practices with support related to the emergency by search criteria such as practice location, provider specialties, affiliation with

a healthcare system or designation as part of the NC Safety Net healthcare system. After deployment, and when necessary, the tracking system can be used by a pool of callers to enable follow-up with non-responding practices to increase awareness and response rates.

In creating the statewide system, partnerships were formed with data owners such as licensure boards, professional societies, state agencies and health systems to receive data feeds of practice information (name, address, services offered, closure status, etc.) and provider information (name, practice affiliation(s), specialties, etc.) with contact information. De-duplication and cleaning processes were implemented as well as logical matching and machine learning algorithms to create a database of uniquely identified practices with their best contact information. As practices respond, any number of custom reports can be generated and provided to those with the ability to respond, such as PPE and financial needs stratified by healthcare preparedness region or vaccine distribution readiness by county or zip code. NC Responds was launched in late January 2021.

Limitations

Our findings must be taken in light of the limitations of our study. Our results are limited to 63 practices with both Phase 1 and Phase 2 data. By the nature of their respective situations, practices with more limited operations or those that were temporarily or permanently closed were less likely to be reached and unable to contribute data. Additionally, the responses in each survey often reflected the voice of only one practice employee, though in some situations, different practice staff were consulted to answer specific questions. It is difficult to predict how such limitations impacted our aggregate results; thus, readers should consider our findings as descriptive only and understand that there could be important variables that we did not capture in our data and, as such, resist making causal inferences from our results.

Conclusion

Small primary care practices have been able to pivot how they delivered care during the pandemic. Many practices in our sample report operating with normal hours despite declines in

patient volume and associated revenue. Despite their successes, many still have ongoing needs and/or challenges with PPE supplies and providing telehealth to their patients. Most are keen to engage in new initiatives to participate in a larger emergency response system to more rapidly have needs assessed and addressed. Furthermore, they shared a desire to engage in timely clinical trials of new COVID-19 related studies despite being taxed with unprecedented challenges. While the needs of hospitals in relation to COVID-19 were well known, the NC Responds system, born out of the experience in our state with COVID-19's impact on primary care, may be a valuable tool for ensuring that the needs of primary care and other practices in NC can be identified and addressed.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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