IDEAS
ACTION
RESULTS

Leveraging Digital Technology to Enable a More Equitable Distribution of the Health Care Workforce

June 2022

Bipartisan Policy Center

STAFF

Sabah Bhatnagar
Senior Policy Analyst, Health Project

Julia Harris
Senior Policy Analyst, Health Project

Tara Hartnett
Project Coordinator, Health Project

G. William Hoagland
Senior Vice President

Marilyn Serafini
Director, Health Project

HEALTH PROJECT

Under the leadership of former Senate Majority Leaders Tom Daschle and Bill Frist, M.D., BPC's Health Project develops bipartisan policy recommendations that will improve health care quality, lower costs, and enhance coverage and delivery. The project focuses on coverage and access to care, delivery system reform, cost containment, chronic and long-term care, and rural and behavioral health.

ACKNOWLEDGMENTS

BPC would like to thank Sheila Burke, Jim Capretta, and Chris Jennings for advising BPC's Health Program. BPC would also like to thank Helmsley Charitable Trust for its generous support.

DISCLAIMER

Table of Contents

Introduction

Challenges arising from the COVID-19 pandemic have worsened an already inequitable distribution of health care providers across rural and urban areas. The pandemic increased rates of staff burnout and early retirement. It also forced nurses and others to drop out of the workforce to care for ailing family members or children who lost access to in-person school and child care. This abrupt contraction of the labor supply increased wage pressures, making it difficult for financially strapped hospitals to compete with other employers. Rural areas, already at a disadvantage with fewer health care providers per capita, experienced more severe workforce problems than their urban counterparts.[1]

One way to improve the distribution of the health care workforce is to leverage technology. Digital technology that enables telehealth and telementoring programs can help rural providers, especially hospitals, reimagine how they provide health care and use the health care workforce.

During the COVID-19 pandemic, Congress and the administration temporarily waived many Medicare telehealth restrictions, which benefited patients and providers alike in both urban and rural areas. Although the full effects of these flexibilities remain to be seen, they have, at a minimum, increased patient access to care and incentivized providers to build their digital capabilities. As a result, many providers already have access to the infrastructure needed for telehealth and telementoring.

Although the rapid uptake of telehealth has opened new possibilities for the health care system, policymakers still need to address the barriers that prevent rural providers from adopting these technologies.

Against this backdrop, BPC examined the ability of three evidence-based programs leveraging digital technology—Project ECHO, telestroke, and tele-ICU—to relieve some of the pressures facing the rural health care workforce. In this brief, BPC also outlines several policy options, including regulatory and legislative reforms, that would increase the use of these programs. Although a variety of policy approaches are necessary to address the underlying drivers of workforce shortages, evidence-based telehealth and telementoring models have the potential to expand provider capacity.

Background

Workforce shortages have historically been cyclical. The pandemic, however, disrupted many of the usual dynamics. In 2021, the national supply of registered nurses dropped by more than 100,000 from the previous year, the largest drop in four decades.[2] Alarmingly, a disproportionate number of exiting nurses were younger and earlier in their careers, compared to those who stayed at the bedside, fueling concerns that the critical nursing shortage will persist long after the federal public health emergency (PHE) ends, and that this shortage will impact all states.[3] Research has shown that inadequate nurse staffing in hospitals is associated with increased patient morbidity and mortality.[4]

Moreover, rural hospital systems reported attrition across every level of the health care system—from top executives and physicians to surgical technicians, dietary staff, and custodial staff.[5] Hospital clinical staff shortages peaked during the omicron variant surge in early 2022—with 22% of hospitals reporting critical staffing shortages by mid-January.[6]

Smaller rural hospitals, in particular, struggled to pay for and maintain staff during the pandemic. Contract staff, particularly travel nurses, played a critical role in filling hospital vacancies. Although this helped ensure continued patient access to services, the use of contract staff was expensive and harmed the finances of struggling hospitals. In some cases, hospitals paid staffing agencies two, three, or more times pre-pandemic rates to fill vacancies.[7]

Rural hospitals provide care to approximately one-fifth of the nation's population and serve many vulnerable Americans.[8] Rural populations tend to be older and sicker than their urban counterparts, and proportionately the share of adults 65 and older in rural America is growing.[9] Although all payers play a role in rural hospital financing, Medicare is often the primary payer, with roughly one out of every three individuals living in rural America enrolled in the Medicare program.[10]

Leading up to the pandemic, 116 rural hospitals closed between 2010 and 2019.[11] These closures occurred across 31 states and were heavily concentrated among small, Critical Access Hospitals (CAHs).[12] Most CAHs are 35 miles from the nearest hospital and have no more than 25 inpatient hospital beds.[13] It is widely believed that the infusion of federal COVID-19 relief dollars staved off more hospital closures, with only two rural hospitals closing in 2021.[14]

BPC released a report in May 2022, *The Impact of COVID-19 on the Rural Health Care Landscape,* which describes the challenges facing rural hospitals and details policy recommendations to immediately stabilize rural health systems.[15] The loss of federal funding when the PHE declaration ends will likely

exacerbate existing workforce inequities between rural and urban areas. The same rural hospitals that were struggling before the pandemic will once again be under pressure to reduce services or close entirely.

The availability of health care workers in rural areas and hospital closures are inextricably linked. According to the Government Accountability Office (GAO), the availability of local health care workers tends to decline at a steeper rate in rural counties that experience hospital closures than in counties that do not experience closures. For example, between 2012 and 2017, in counties where hospitals closed, the number of physicians fell from a median of 71.2 to 59.7 per 100,000 residents. Decreases in counties without closures were much smaller (87.5 to 86.3 physicians per 100,000 residents).[16]

Rural areas also have far fewer specialty providers than their urban counterparts. Urban areas have 30.8 physicians per 10,000 residents; rural ones have 10.9 physicians per 10,000.[17] Not surprisingly, cardiology, psychiatry, radiology, obstetrics, and other specialties are less available in rural counties.[18] Family physicians are the most likely type of provider to be present.[19]

Congress and multiple administrations have long supported the health care workforce and efforts to bring more providers to rural America. Currently, the Health Resources and Services Administration (HRSA) funds many programs to address rural workforce shortages, including the National Health Service Corps, which repays student loans in return for a provider serving in rural areas. Congress also passed the Dr. Lorna Breen Health Care Provider Protection Act in 2022 (P.L. 117-105), which promotes mental health resiliency among health care providers, invests in disseminating best practices, and encourages health care providers to seek mental health treatment.[20]

Additionally, throughout the COVID-19 public health emergency, Congress and the Trump and Biden administrations supported broad flexibilities in telehealth. These policies paved the way for an unprecedented utilization of telehealth services, which peaked at more than 32% of Medicare claims in April 2020 and leveled off to 13% to 17% of claims by July 2021.[21] A broad swath of providers in rural and urban areas adopted telehealth technologies, and telehealth holds promise for creating new access points to care.

BPC looked at three evidence-based programs—Project ECHO, telestroke, and tele-ICU—that leverage digital technology to assess how they might maximize the use of a stretched and inadequate health care workforce; how they could help to redistribute resources across rural and urban areas; and how they could help keep patients at their local hospitals while ensuring high quality care—thereby improving the financial position of struggling rural hospitals.

Evidence-Based Models

PROJECT ECHO

Model description:

Project ECHO (Extension for Community Healthcare Outcomes) is a distance-learning, telementoring model designed to help primary care clinicians and other community providers deliver expert care to patients where they live. Begun in 2003, the model leverages video-conferencing technology to train, advise, and support community health care providers. Many ECHO projects use a hub-and-spoke network model where a hub of experts, such as specialty providers often located in academic medical centers, mentor others, such as primary care providers about a particular condition or treatment.[22] Project ECHO increases access to specialty treatment in rural and underserved areas for a variety of conditions, such as hepatitis C, diabetes, and other complex medical conditions.

Four main principles guide Project ECHO programs: using technology to leverage scarce resources; sharing best practices to reduce disparities; engaging in case-based learning to master complexity; and using a web-based database to monitor outcomes. Under-resourced and understaffed rural health facilities have benefited from the ECHO model to compensate for specialist shortages.

During the COVID-19 pandemic, Idaho—which ranks 50th in practicing physicians per capita—used CARES Act funding to ramp up ECHO programs to increase primary care physicians' access to specialists and best practices for treating patients with complex conditions, including mental health challenges and substance abuse disorders. ECHO Idaho connected more than 1,000 health care workers and other professionals in a 15-month period.[23]

Also during the pandemic, ECHO, in partnership with the Agency for Healthcare Research and Quality (AHRQ), established a national network to help nursing homes implement rapidly evolving COVID-19 best practices. More than 32,000 health professionals from over 9,000 nursing homes participated. Eighty-five percent of nursing homes reported they substantially changed their practices based on what they learned. Similarly, ECHO worked closely with the Office of the Assistant Secretary for Preparedness and Response (ASPR) within the Department of Health and Human Services (HHS) to set up a national provider network to disseminate novel COVID-19 information to frontline providers. These partnerships showed how the ECHO network can serve as a public health resource in times of emergency.[24]

Project ECHO can also be used to train a variety of other health care providers beyond doctors and nurses. This training can include unlicensed providers, such as community health workers (CHWs), who primarily deliver health education in rural and vulnerable communities. The ECHO Community Health Worker (CHW) model was developed to support and improve the skills of CHWs, based on the needs of providers and the communities they serve. These health workers are trained for specialized interventions using best practices that can be applied in a variety of contexts.[25]

Model outcomes:

The University of New Mexico developed Project ECHO to advance hepatitis C treatment and has produced positive clinical outcomes. A study published in the *New England Journal of Medicine* in 2011 found that during a five-year period, patients receiving care for hepatitis C (HCV) at ECHO sites had outcomes similar to those treated at specialty clinics. Nearly 60% of patients treated at ECHO sites had a sustained virologic response, a rate that was not statistically different from patients treated at the University of New Mexico's HCV clinic.[26]

Regarding behavioral health care, multiple studies show that the ECHO model increased the number of Drug Enforcement Agency registered practitioners who receive a waiver from the Substance Abuse and Mental Health Services Administration (SAMHSA) to prescribe, administer, and dispense buprenorphine (used to treat opioid dependence), reduced the number of patients treated with opioids for chronic pain compared to a control group, and lowered the number of opioid prescriptions per patient.

A systematic review of outcomes associated with Project ECHO found that the model was both effective at treating a variety of health conditions and chronic illnesses and had cost-saving potential.[27] An analysis of Project ECHO's ability to enhance CHW capacity found a significant improvement in health workers' self-efficacy to perform their duties and address social determinants of health after attending ECHO sessions.[28]

Although Project ECHO has produced positive outcomes for HCV, behavioral health, and other chronic conditions, the program is not a monolith. The telementoring model can be used to enhance provider capacity to treat cancer, dermatologic conditions, and pulmonary disorders, among others. Outcomes may not be consistent across topic area—highlighting a need for more comprehensive evaluation.[29]

Current financing:

Despite receiving grants from federal, state, and local governments, Project ECHO has no ongoing federal funding stream or clear billing mechanism for health insurance. Nearly half of the Project ECHO funding comes from grants from HRSA, AHRQ, the Centers for Disease Control and Prevention (CDC), and

SAMHSA, while 44% comes from other funding sources, including philanthropic organizations.[30]

Although the Centers for Medicare & Medicaid Services (CMS) do reimburse providers for virtual, interprofessional consultations as eConsults, Project ECHO moves well beyond a physician consulting another about a specific patient. The model is closer to virtual grand rounds intended to ensure providers at spoke sites are up to date on best practices and evolving areas of medicine—ones that may be outside their core practice area. Unfortunately, Medicare has no billing mechanism for this type of interaction. In 2019, the Center for Health Care Strategies released a report outlining the possible pathways for sustainable funding, including embedding funding for Project ECHO in HRSA health center grants.[31] These policy recommendations are discussed in further detail in the policy options section of this brief.

Model prevalence:

As of June 2022, ECHO had 272 hubs operating across the United States, and a cumulative total of 3.45 million unique attendances in ECHO sessions from around the world.[32] When the Office of the Assistant Secretary for Planning and Evaluation (ASPE) contracted with RAND in 2019 to evaluate ECHO and ECHO-like programs, it found 585 ongoing and recent ECHO projects—88 were added in 2017 alone. Colorado and New Mexico had the largest ECHO presence, accounting for more activity than the bottom 25 states combined. Every state had at least one active ECHO program, but the number of programs varied. For example, Wisconsin and South Dakota—both states with significant rural populations—had only two ECHO programs.[33]

Workforce impact:

Project ECHO can enhance the ability of rural health care providers to treat patients closer to home and to improve clinical outcomes. Studies show that Project ECHO participation has a positive impact on provider performance for pain management (physical medicine services and initiation of nonopioid medications) and patient health.[34] Specialists at academic medical centers can mentor providers in rural areas, thereby allowing patients to stay in their communities and struggling hospitals and clinics to retain patients. Academic medical centers, such as the Texas A&M Rural and Community Health Institute, have used knowledge-sharing through ECHO to assist vulnerable hospitals at risk of closure.[35] With sustainable financing, Project ECHO can be a valuable tool to address both unequal distribution of providers and rural hospital closures.

TELESTROKE

Model description:

Stroke can result in serious long-term disability and is a leading cause of death in the United States, affecting approximately 800,000 Americans per year.[36] For the best patient outcomes after a stroke, physicians must deliver lifesaving treatment

within three hours of symptom onset.[a] That task is challenging in rural and underserved areas that have limited access to neurologists who can diagnose and treat stroke.

Telestroke is the use of telehealth specifically for stroke care; it allows physicians at tertiary care centers, often vascular neurologists, to evaluate and remotely treat stroke patients in the emergency room. Doctors at local hospitals, who may not have adequate stroke expertise, work with an off-site physician who can perform neurological assessments and triage the patient, evaluate brain imaging, and aid in diagnosis and treatment. This model bypasses the need to urgently transfer suspected stroke patients to larger regional hospitals, which takes time and limits the efficacy of treatment.[37]

Hospitals can receive access to telestroke through a hub-and-spoke model or use private third-party vendors—or undertake some combination of the two. After consultation, a patient may remain at the local site or spoke hospital, or be transferred to a facility that can provide a higher level of care.[38]

Model outcomes:

Strong evidence supports the use of telestroke, especially because the therapeutic window to treat stroke is so short.[39] A study of more than 150,000 patients treated for stroke found that patients who received care at hospitals with telestroke capacity had higher rates of reperfusion treatment, which restores blood flow to blocked arteries, and lower 30-day mortality compared with those treated in hospitals without telestroke.[40] The gains were greatest in smaller hospitals in rural areas.[41]

Without access to telestroke, patients at smaller emergency departments may be transferred to another health center—wasting precious time needed to administer effective stroke treatment and affecting the smaller hospital's ability to retain patients. A recent analysis from the U.S. Department of Veterans Affairs found that telestroke helped prevent such hospital transfers, allowing patients to be treated in their community and improving the timeliness of treatment.[42]

Current financing:

Telestroke was the first telehealth service to receive Medicare reimbursement outside of rural areas due to the Furthering Access to Stroke Telemedicine (FAST) Act, which passed as part of the Bipartisan Budget Act of 2018 (P.L.115-123) and went into effect January 1, 2019.[43,44]

a Tissue plasminogen activator (tPA), a therapy that dissolves clots, must be administered as quickly as possible to limit brain damage from a stroke. Newer, more effective treatments such as Tenecteplase (TNK) also depend on quick administration to achieve positive clinical outcomes.

Model prevalence:

An analysis of FAST Act implementation found that both urban and rural hospitals increased the use of telestroke substantially, from less than 1% of strokes being associated with billed Medicare telemedicine consultations before the FAST Act, to approximately 3%, by the end of 2019.[45] Usage rose again during the COVID-19 pandemic, with approximately 6% of strokes experienced by Medicare beneficiaries being treated via telestroke in early 2021.[46]

Workforce impact:

Telestroke is especially beneficial for hospitals in rural areas where neurologists are in short supply and the stroke mortality rate is significantly higher than in urban areas.[47] These hospitals can use telestroke to cover gaps in care and reduce the burden on staff neurologists, while improving stroke outcomes. Additionally, small hospitals in rural and frontier areas may not see the volume of patients needed to justify hiring neurologists to provide stroke care and often struggle to hire neurologists because of provider shortages. Telestroke allows them to treat stroke patients and receive payment for their care without having to hire a neurologist.

TELE-ICU

Model description:

Between 4 and 6 million patients are admitted to the intensive care unit (ICU) every year.[48] Rural areas often experience intensivist shortages, while demand for them continues to grow due to COVID-19 and an aging population. Using tele-ICU, intensivists—specialists who treat critically ill patients—at remote sites can monitor ICU patients at rural facilities and guide local physicians and nurses through an acute event using audio-video technology and data sharing. These programs extend workforce capacity at rural hospitals by providing bedside staff with clinical resources. Providers at the rural facility transmit real-time data, enabling the remote tele-ICU physician to get a complete picture of the patient. The teleintensivist can monitor an ICU patient's physiological data, prescribe medications, order laboratory tests, and oversee best practice adherence.[49]

Although telestroke is a more straightforward service than tele-ICU, the latter has the potential to create economies of scale. Tele-ICU programs can be as simple as allowing two-way, audiovisual communication between intensivists and local ICUs or as complicated as providing access to data exchange through electronic medical records, imaging systems, and tools that enable the transfer of timely information to help inform decisions about a patient's care.[50] Medical centers and health systems can sometimes offer 24/7 tele-ICU support to partner hospitals on everything from providing critical care to helping patients after their release.

Model outcomes:

Studies have demonstrated that tele-ICU programs enhanced care plans, improved clinical outcomes, reduced hospital transfers, and were associated with increased best-practice adherence.[51] One 2018 meta-analysis found that, compared to nonadopter hospitals, tele-ICU was associated with lower 90-day mortality.[52] An earlier review from 2013 found that tele-ICU programs resulted in a 15% to 60% reduction in mortality rates and a 30% reduction in lengths of stay. Mortality rates varied by hospital. For example, a 10-bed surgical ICU at Johns Hopkins Medical Center in Maryland saw its mortality rates decrease by 46%, while Maine Medical Center saw reductions of 20%.[53]

Tele-ICU programs focusing on harm reduction have seen improvements in hospital acquired infections, early recognition for sepsis, mortality rates, and length of stay.[54] Advocate Aurora Health uses telehealth to improve disease management quality, share best practices, educate and mentor nurses, and assess whether there are gaps in current knowledge. Its Illinois tele-ICU program saved 507 lives (the mortality ratio went from 0.42 to 0.22) and resulted in a decrease of 259 ICU days ($959,000 cost avoidance) and 441 vent days ($287,000 cost avoidance) in 2018 alone.[55] South Dakota's Avel eCare ICU, one of the first tele-ICU's in the country, has seen reductions in patient stays in the ICU through faster response times to complications.[56]

Current financing:

Remote sites tend to use G-codes, Medicare billing codes used by practitioners to describe specific telehealth services, to seek Medicare reimbursement for tele-ICU. For example, HCPCS code G0508 is used for telehealth consultation, critical care, and initial consults.[57] Although this reimbursement mechanism is critical, some health systems and academic medical centers feel that it does not adequately account for a provider's expertise and time.

Model prevalence:

A recent study found that of hospitals with an ICU, 27% reported tele-ICU capabilities. Rural and Critical Access Hospitals were less likely to have these capabilities. In 2018, Alabama, Connecticut, Michigan, Nevada, and New Hampshire had the fewest hospitals with tele-ICU services.[58]

Workforce impact:

In many ways, tele-ICU has become critical for rural hospitals due to its importance to the health care workforce and patient outcomes. Although staffing depends on the tele-ICU structure, teleintensivist physicians can monitor 100 patients remotely, while tele-ICU nurses can monitor 30 to 50 patients. The bedside RN to patient ratio, by contrast, is 1:3.[59] Bedside clinicians typically can deal with only one emergency at a time, but remote clinicians can address three to four codes at the same time by monitoring multiple patients remotely. Hospitals that adopt tele-ICU do not need to have intensivists on

their payroll—an investment that often does not make sense for low volume facilities. A representative from Advocate Aurora stated, "Amid this [workforce] scarcity, the e-ICU program helped provide specialized critical care across the health system without straining those already overwhelmed with the demand for care." One example is that the e-ICU can alleviate the need for on-site respiratory therapists to support monitoring patients on ventilators.[60]

Additionally, partnerships between bedside nurses and critical care nurses via tele-ICU can reduce stress and burnout for new nurses. A November 2021 survey of registered nurses found that nearly one-third were likely to leave their current positions providing direct patient care; insufficient staffing levels was the single greatest factor cited.[61] Tele-ICU and other support programs provide guidance and mentorship from experienced critical care nurses and have the potential to alleviate stress and burnout for bedside nurses.

Policy Options

Congress and the administration can promote Project ECHO, telestroke, and tele-ICU to ensure that they become a more prevalent and sustainable part of the nation's health care infrastructure. Small rural hospitals are most likely to benefit from telehealth programs, but they are often the least likely to have them, predominantly because of financial constraints.[62] Investments in telehealth infrastructure can mitigate workforce shortages, close care gaps in rural areas, and help improve the financial standing of hospitals at risk of closure. Although BPC's recommendations focus on Medicare, private insurers should also evaluate the adequacy of their reimbursement, if at all, and any other support given to providers implementing these models.

Policy options to support further growth of these programs include:

- Development and testing of new and enhanced financing mechanisms;
- Identification of ongoing insurer-based reimbursement opportunities;
- Technical assistance for providers to adopt new models;
- Enhancement of current cross-state licensure laws; and
- Acceleration of efforts to achieve interoperability.

DEVELOPMENT AND TESTING OF NEW AND ENHANCED FINANCING MODELS

Propping up the infrastructure required to implement Project ECHO, tele-ICU, and telestroke programs can involve significant upfront investments. For example, a 2013 study found that it took hospitals $2 million to set up and install command center tele-ICU systems, with operating costs reaching $600,000 to $1.5 million per year. However, during the study period, ICU costs decreased 25% to 31% due to lower mortality rates, shorter ICU lengths of stay, lower variable costs per case, and increased revenues from higher case volumes.[63] Estimates show that the average cost of implementing an ECHO program is $200,000 a year.[64] Smaller providers and hospitals have the potential to reap the greatest benefit from these telehealth programs, but they are also less likely to have the capital to make infrastructure investments.

- **Congress should consider designating a portion of Public Health Service Act Section 330 funding for startup and operational costs for providers participating in Project ECHO.**

Community health centers such as Federally Qualified Health Centers (FQHCs) are an integral part of the rural health landscape and support medically underserved areas. FQHCs receive grant funding from HRSA, as authorized under Section 330 of the Public Health Service (PHS) Act. As mandated in Section 330, most awards support comprehensive primary care services to underserved communities (or service areas) and to specific underserved populations, such as migratory and seasonal agricultural workers, individuals experiencing or at risk for homelessness, and residents of public housing. Section 330 appropriations, which do not have a designation for Project ECHO participation, have more than doubled since the program's inception in 2010 (from $2.2 billion to $5.6 billion in FY2021).[65, 66] Congress should consider designating a portion of Section 330 funding for startup and operational costs for providers participating in Project ECHO.

Despite the initial investments involved with Project ECHO, researchers found that the program was efficient and provided good value for hepatitis C diagnosis and treatment. In a 2017 analysis, they simulated disease progression, quality of life, and life expectancy and found that there were positive outcomes associated with Project ECHO. The incremental cost-effectiveness ratio was about $10,000 per quality-adjusted life year (QALY) compared to the status quo.[67] Additionally, studies showed that the costs of implementing Project ECHO drop over time. Based on a model assuming 1,000 patients participate in an ECHO program, researchers estimate that for every dollar spent on Project ECHO, a health system could save $4.45 in hospitalization costs alone (if each hospitalization cost about $10,000).[68] Establishing a sustainable pathway for investing in Project ECHO could not only improve outcomes but also produce savings.

- **HRSA should consider delaying HPSAs designated as "proposed for withdrawal" by one year and give funding preferences to facilities that invest in telehealth.**

HRSA's Bureau of Health Workforce designates Health Professional Shortage Areas (HPSA) based on the number of health professionals relative to high need population. These designations are based on primary care, dental, and mental health provider shortages and are used to allocate resources for federal programs that place providers in underserved areas in exchange for scholarships and loan forgiveness. In addition, the Medicare HPSA Physician Bonus Program provides a 10% bonus to physicians who provide care to Medicare beneficiaries in a geographic HPSA. In other words, the physician receives increased reimbursement for providing services in a HPSA ZIP code.[69] Physicians with J-1 visas are also allowed to waive certain requirements to remain in the United States if they practice in a HPSA. Health centers often rely on HPSA bonuses and loan forgiveness programs to draw providers to underserved areas.

The Health Resources and Services Administration reviews and revises lists of designated HPSAs annually and might propose withdrawal for ones that no

longer meet program criteria. In January 2022, HRSA proposed withdrawal for 1,178 primary care HPSAs—accounting for 15% of all primary care HPSAs.[70] According to the agency, these facilities no longer meet the federal criteria to be designated as a shortage area. These HPSAs will not lose their designation immediately and will remain on the "proposed for withdrawal" list until the agency publishes another Federal Register notice. The removal of this designation will cause upheavals during an existing workforce crisis and limit access to rural providers, especially in the wake of the COVID-19 pandemic. HRSA should consider delaying HPSAs designated as "proposed for withdrawal" by one year and give funding preferences for existing HPSA facilities to invest in the infrastructure required to launch telestroke and tele-ICU programs (for example, technology infrastructure in hospital rooms). A delay would allow rural providers to present additional data to HRSA in the redetermination process.

Rural hospital investment in tele-ICU and telestroke infrastructure can vary. Some hospitals may use mobile carts to facilitate and deliver care while others use robots or fixed audio/visual systems. An estimate of Philips tele-ICU products found that mobile carts can cost $12,000 each, while virtual servers can cost $250,000. These technologies also require regular maintenance, and onsite staff may have to be trained to use them.[71]

A 2019 cost-benefit analysis found that over a six-month period, a centralized tele-ICU program produced $3.14 million in savings by reducing ICU variable costs per case, decreasing length of stays, and decreasing ICU mortality. The hardware and software costs during the six months were approximately $600,000.[72]

Although initial investments in a tele-ICU infrastructure can be substantial, a 2017 report to CMS found that Emory University's eICU (tele-ICU) program resulted in fewer readmissions and reduced costs by millions of dollars.[73] The institution used CMS Health Care Innovation Award funds to expand access to critical care services for intensive care units in north Georgia. The program supported more than 8,000 patients between 2014 and 2015 and reduced Medicare spending by $1,486 per patient stay—totaling $4.6 million during the study period. Researchers attributed savings to a more standardized care delivery process and an increased rate of discharges to home.[74] Giving funding preferences to HPSA-designated providers to invest in telehealth infrastructure may help them expand the capacity of their workforce.

- **Congress and the administration should engage in a comprehensive evaluation of technology-enabled collaborative rural workforce HRSA programs.**

HRSA provides grant funding for multiple programs that support the recruitment and retention of qualified health professionals in rural areas. However, certain programs and educational opportunities may be more

effective in ensuring that rural workforce needs are being met. Additionally, Project ECHO programs aim to address a variety of conditions and outcomes, and a return on investment may not be consistent across topic area.

RAND's evaluation of Project ECHO and other ECHO-like models (EELM) included recommendations to address barriers to evaluating EELM.[75] An unbiased organization, such as the GAO or the National Academy of Sciences, should comprehensively evaluate technology-enabled collaborative HRSA programs of the rural workforce. To identify funding opportunities, the evaluation could determine whether these programs build provider capacity, address rural workforce needs, and produce positive clinical outcomes.

Looking at studies published before 2018, the RAND report to Congress showed that although the impact on patient and provider outcomes was modest, researchers consistently found positive effects. However, they also reported that the quality of evidence was not strong, and that more data are needed on EELM return on investment.[76]

Criteria used by RAND could guide an agency or organization in selecting programs to evaluate: "(1) specialist-generalist training, (2) interactive mentorship, (3) case-based presentations, (4) technology-enabling platforms, (5) a hub-spoke framework, (6) multiple sessions over extended time, and (7) a health-focused objective." Ongoing evaluation of Project ECHO and similar technology-enabled collaborative programs would allow policymakers to assess the impact on specific populations and services and appropriate additional funding for telementoring programs. The evaluators should recommend which programs should be prioritized and which should be altered or sunset.

One way to ensure that federal interventions effectively address the most critical health care workforce shortages is for Congress to appropriate funding for the National Health Care Workforce Commission. The commission was established and authorized under the Affordable Care Act in 2010, but Congress has never appropriated funding.[77] The commission was supposed to perform a comprehensive evaluation of the workforce landscape, develop policy recommendations to ensure federal education and training programs meet critical needs, and provide oversight of federal workforce programs.

IDENTIFICATION OF ONGOING INSURER-BASED REIMBURSEMENT OPPORTUNITIES

By 2030, CMS expects that all beneficiaries in traditional Medicare will be treated by a provider participating in a value-based model with accountability for quality and total cost of care.[78] In a value-based health care system, providers can invest their resources in a way that produces the best clinical and quality outcomes, and evidence-based models like Project ECHO, telestroke, and tele-

ICU are more easily sustained. As a bridge, however, ongoing reimbursement for these services needs to be sustainable under fee-for-service models.

- **CMS should consider paying smaller rural hospitals for telestroke and tele-ICU services via a monthly or yearly payment.**

Smaller hospitals—especially rural hospitals and CAHs—are all less likely to use telestroke than larger suburban hospitals. This has the potential to create disparities in clinical outcomes across less advantaged populations.[79] The reasons smaller hospitals face challenges in establishing these programs range from difficulty with upfront financing to problems with billing for services to maintaining the workability of the technology.

Instead of paying fee-for-service for telehealth services, Medicare should consider developing a monthly or yearly payment that would enable smaller rural hospitals to have telestroke and/or tele-ICU capacity in place. More than patients would benefit: Regular payments would be aligned with the administration's audacious goal of moving all Medicare providers into value-based payment arrangements.

Researchers found that a telestroke network model consisting of one hub and seven spokes would allow for 45 more patients to be treated with intravenous thrombolysis and 20 more with endovascular stroke therapies, leading to more discharges to home and to cost savings. (Both evidence-based therapies were shown to produce good outcomes and reduce long-term disability.) The researchers estimated that each year, a telestroke network could help produce more than $350,000 in cost savings—while each hub costs about $450,000 to maintain, each of the seven spokes saves approximately $100,000.[80]

- **CMS should consider enhanced reimbursements for telestroke and tele-ICU programs for at-risk hospitals.**

A 2015 study found that the initial cost associated with equipment and internet connectivity to implement telehealth ranges from $17,000 to $50,000, with annual subscription fees and maintenance expenses adding to this number.[81] Small hospitals may not be able to afford the investments needed to hire full-time neurologists or intensivists, especially if they have low patient volumes.

Medicare currently reimburses spoke hospitals via a facility payment and a physician payment, while the remote physician (at the hub) can receive a separate payment for the consultation. An enhanced Medicare reimbursement for the spoke facility could better support smaller rural hospitals that adopt and maintain telestroke and tele-ICU programs.

- **CMS should consider adding Project ECHO to the Medicare Physician Fee Schedule (PFS) as well as other sustainable funding mechanisms.**

Despite receiving grants from federal, state, and local governments, Project ECHO has no ongoing federal funding stream or clear billing mechanism for

health insurance. A patchwork of federal, state, and philanthropic funds, that are often siloed and uncoordinated, currently support Project ECHO.[82] The success of the model rests on the ongoing ability of providers to invest in and continue learning within the program to maintain better quality outcomes.[83]

CMS's Medicare Physician Fee Schedule is a complete listing of health care services that can be reimbursed by the Medicare program; it is updated annually. As a result of the pandemic, the agency added several billable telehealth services to the PFS. Project ECHO is not currently reimbursable under traditional Medicare.[84] CMS could add a new or revised billing code to the Physician Fee Schedule to cover doctors participating in the ECHO program who seek a specific patient consultation through the program. While store-and-forward asynchronous interprofessional interactions are reimbursed as eConsults, Project ECHO does not have a similar mechanism for reimbursement because its model more resembles virtual grand rounds.[85]

Another option is for the administration to support ongoing funding using existing authorities. The first Expanding Capacity for Health Outcomes (ECHO) Act, which passed in 2016, aimed to examine technology-enabled collaborative learning programs, including Project ECHO, and required HHS to deliver a report to Congress on its findings. A second version of the ECHO Act, passed in 2019, established a $50 million grant program and technical assistance to support ECHO implementation over five years.[86,87]

The Consolidated Appropriations Act of 2021 (P.L. 116-260) gave the HHS secretary authority to "appropriate, award grants to evaluate, develop, and, as appropriate, expand the use of technology-enabled collaborative learning and capacity building models, to improve retention of health care providers and increase access to health care services."[88] The provision applies to medically underserved and shortage areas, and stipulates that grant funding can be used to support health care providers using Project ECHO. The secretary could use his authority to enhance funding for programs that support a sustainable workforce and cover startup costs for technology-enabled collaborative learning and capacity building models.

- **CMS should develop additional guidance for the billing of telestroke and tele-ICU programs to ensure appropriate coding and reimbursement.**

Recent analysis of telestroke claims showed that many hospitals are underbilling for the service as well as making mistakes in how they bill when they do seek reimbursement.[89] By the end of 2019, only 40% of hospitals with known telestroke capacity sought reimbursement for telestroke services (within one year of the FAST Act implementation). Claims data likely substantially underestimate the actual number of telestroke consultations. This situation has led some experts to advocate for simplified Medicare billing rules. Current billing rules are highly complex and require the remote specialist to have

patient demographic information, insurance information, and registration with the health plan for the hospital in which the patient is located.

Greater complexity in billing rules creates an environment that dissuades providers from engaging in telehealth, even when these models may make sense for patients. Additionally, improvements in billing accuracy for telestroke and tele-ICU would improve claims data for evaluation of these programs and future policymaking. To help remedy these challenges and take advantage of lessons learned, CMS should work to simplify telehealth billing and educate providers on billing practices to help ensure providers are, at minimum, receiving appropriate reimbursement for services rendered.

TECHNICAL ASSISTANCE FOR PROVIDERS TO ADOPT NEW MODELS

Barriers to adoption include providers' lack of understanding of how to implement these models as well as the long-term benefits of these investments. Therefore, in addition to sustainable financing, it is also important to provide technical assistance.

- **The CMS Innovation Center should lead a technical assistance effort to further deploy evidence-based models.**

The CMS Innovation Center develops demonstration projects to test new ways of paying for and delivering health care services, and then works to institutionalize new proven models. The Innovation Center should invest in technical assistance to promote specific models, such as Project ECHO, that have already been shown to produce care savings.

In 2012, the Innovation Center awarded New Mexico approximately $8.4 million for a Project ECHO demonstration expanding the capacity of the primary care workforce to treat Medicaid enrollees with complex, multiple chronic conditions.[90] An independent evaluation of all model awardees showed an average quarterly cost savings of $2,044 per beneficiary for the ECHO program—Project ECHO was associated with lower total cost of care and fewer potentially avoidable hospitalizations, relative to a comparison group.[91]

The Innovation Center should take steps to better inform providers and other stakeholders, such as hospital executives, of program benefits, including through the development of implementation toolkits and citing examples of successful programs. Additionally, accountable care organizations (ACOs) participating in the Medicare Shared Savings program should be encouraged to participate in a telementoring program.[92]

ENHANCEMENT OF CROSS-STATE LICENSURE LAWS

Although states have always maintained the authority to license and regulate health care providers, critics argue that this limits provider competition and innovation in health care. Specifically, state licensing of health care professionals has created numerous barriers to providers' adoption and expansion of telehealth programs.

- **Congress and the administration should consider making provider licensure flexibilities, which help enable telestroke and tele-ICU, permanent for Medicare beneficiaries.**

At the beginning of the COVID-19 pandemic, CMS and nearly all states loosened the requirement that providers be licensed in the state where their patients are located. In a matter of months, a famously territorial and complicated area of health policy unwound, creating opportunities for patients to access care. This was especially important for patients living in remote or medically underserved areas. BPC's 2021 report, *What Eliminating Barriers to Interstate Telehealth Taught Us During the Pandemic*, articulated several broad policy options that Congress and the administration could take regarding provider licensure and telehealth. Policy options included permitting any physician with a medical license in good standing to deliver services via telehealth to Medicare beneficiaries residing in any state, similar to the exemptions allowed by the Department of Veterans Affairs.[93]

ACCELERATION OF EFFORTS TO ACHIEVE INTEROPERABILITY

- **CMS, ONC, and OIG should accelerate their efforts to achieve an interoperable system by issuing guidance and offering technical assistance to encourage continued uptake of Application Programming Interfaces (APIs) and support the creation of data-sharing ecosystems.**

Achieving electronic health record (EHR) interoperability—the seamless and secure access, exchange, and use of electronic health information—will improve patient care as well as spur innovations such as the ones described in this report. For example, the emergent nature of stroke and critical care relies on the timely and accurate exchange of health information, often across health care facilities.[94] As a result, the lack of interoperability presents challenges to some hospitals using tele-ICU and telestroke.[95] Similarly, a 2019 RAND report to Congress highlighted the importance of data exchange and interoperability between hubs and spokes participating in Project ECHO and ECHO-like models. The authors envisioned a strong federal role in developing and deploying interoperability standards.[96]

Interoperability across health IT platforms depends on both system accessibility and a common language for sharing data. Achieving interoperability in the health care sector has been a challenge despite the efforts of multiple administrations and stakeholders. A major milestone was the 2016 passage of the bipartisan 21st Century Cures Act, which required the federal government to establish a foundation for interoperability through standardized APIs. Subsequently, under the Obama and Trump administrations and continuing under the current administration, CMS, the Office of the National Coordinator for Health Information Technology (ONC), and the HHS Inspector General (OIG) released a number of regulations and guidance—some of which have not been enforced due in part to the COVID-19 pandemic—to ensure all systems have the capacity to share information. They did so by releasing API certification standards and penalizing providers that inappropriately block information sharing. API adoption, however, has been slow, and variability of programming languages across health IT systems remains.[97]

Given that interoperability would allow for the seamless transfer of information between EHRs at clinical sites, CMS should develop and finalize rulemaking on data exchange to encourage API adoption in coordination with ONC and OIG. Additionally, the agencies should coordinate their outreach and technical assistance to educate providers and payers on the benefits of creating data-sharing ecosystems (outlined in The Trusted Exchange Framework and Common Agreement).[98] Because CMS interacts with providers differently than ONC, CMS could complement ONC's outreach efforts on the framework by reaching a different audience.

Conclusion

Telehealth programs such as Project ECHO, tele-ICU, and telestroke provide tools to help underserved, rural areas struggling with an inadequate supply of health care providers. These evidence-based programs can work to distribute health care expertise more equitably; keep patients in their local communities; increase access to specialized health care services; produce positive improvements in clinical outcomes; decrease health disparities between rural and urban areas; and reduce stress and burnout for bedside providers. Often, small, rural hospitals do not have the resources to invest in the telehealth infrastructure necessary to implement these models. The multifaceted regulatory and legislative reforms outlined above can make a meaningful difference in the ability of rural health care providers to respond to the needs of these frequently underserved communities.

Endnotes

1 Rural Health Information Hub, "Rural Healthcare Workforce," 2020. Available at: https://www.ruralhealthinfo.org/topics/health-care-workforce.

2 D.I. Auerbach, P.I. Buerhaus, et al., "A Worrisome Drop In The Number Of Young Nurses," *Health Affairs*, April 13, 2022. Available at: https://www.healthaffairs.org/do/10.1377/forefront.20220412.311784.

3 Ibid.

4 Agency for Healthcare Research and Quality, *Nursing and Patient Safety*, April 2021. Available at: https://psnet.ahrq.gov/primer/nursing-and-patient-safety.

5 Bipartisan Policy Center, *The Impact of COVID-19 on the Rural Health Care Landscape*, May 2022. Available at: https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2022/04/BPC-Rural-Hospital-Report-4-22-22.pdf.

6 Assistant Secretary for Planning and Evaluation, *Impact of the COVID-19 Pandemic on the Hospital and Outpatient Clinician Workforce*, May 2022. Available at: https://aspe.hhs.gov/sites/default/files/documents/9cc72124abd9ea25d58a22c7692dccb6/aspe-covid-workforce-report.pdf.

7 Congress of the United States, "A Letter to Mr. Jeffrey Zients," November 15, 2021. Available at: https://www.wpr.org/sites/default/files/pricegouging.pdf.

8 U.S. Census Bureau, "New Census Data Show Differences Between Urban and Rural Populations," December 8, 2016. Available at: https://www.census.gov/newsroom/press-releases/2016/cb16-210.html.

9 A.S. Smith and E. Trevelyan, *The Older Population in Rural America: 2012-2016*, September 2019. Available at: https://www.census.gov/content/dam/Census/library/publications/2019/acs/acs-41.pdf.

10 Assistant Secretary for Planning and Evaluation, *Access to Affordable Care in Rural America: Current Trends and Key Challenges*, July 2021. Available at: https://aspe.hhs.gov/sites/default/files/2021-07/rural-health-rr.pdf.

11 Cecil G. Sheps Center for Health Services Research, University of North Carolina, "Rural Hospital Closures," 2022. Available at: https://www.shepscenter.unc.edu/%20programs-projects/rural-health/rural-hospital-closures/.

12 Ibid.

13 Centers for Medicare & Medicaid Services: Medicare Learning Network, *Critical Access Hospital*, March 2021. Available at: https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/CritAccessHospfctsht.pdf.

14 Cecil G. Sheps Center for Health Services Research, University of North Carolina, "Rural Hospital Closures," 2022. Available at: https://www.shepscenter.unc.edu/%20programs-projects/rural-health/rural-hospital-closures/.

15 Bipartisan Policy Center, *The Impact of COVID-19 on the Rural Health Care Landscape*, May 2022. Available at: https://bipartisanpolicy.org/report/the-impact-of-covid-19-on-the-rural-health-care-landscape/.

16 MedPAC, *June 2021 Report to the Congress: Medicare and the Health Care Delivery System*, June 2021. Available at: https://www.medpac.gov/document/june-2021-report-to-the-congress-medicare-and-the-health-care-delivery-system/.

17 Rural Health Information Hub, "Rural Healthcare Workforce," 2020. Available at: https://www.ruralhealthinfo.org/topics/health-care-workforce.

18 T. Barreto, A. Jetty, et al., "Distribution of Physician Specialties by Rurality," *The Journal of Rural Health*, 37(4): 714-722, 2020. Available at: https://doi.org/10.1111/jrh.12548.

19 Ibid.

20 Public Law 117 – 105, Dr. Lorna Breen Health Care Provider Protection Act, 2022. Available at: https://www.congress.gov/117/plaws/publ105/PLAW-117publ105.pdf.

21 O. Bestsennyy and G. Gilbert, et al., "Telehealth: A quarter-trillion-dollar post-COVID-19 reality?" McKinsey & Company, July 9, 2021. Available at: https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/telehealth-a-quarter-trillion-dollar-post-covid-19-reality.

22 S. Arora, K. Thornton, et al., "Outcomes of Treatment for Hepatitis C Virus Infection by Primary Care Providers," *New England Journal of Medicine*, 364: 2199-2207, 2011. Available at: https://doi.org/10.1056/NEJMoa1009370.

23 Northwest Regional Primary Care Association, "The Power of Project ECHO in Idaho," July 19, 2021. Available at: https://www.nwrpca.org/news/573914/The-Power-of-Project-ECHO-in-Idaho.htm.

24 Agency for Healthcare Research and Quality, "Data and Impact from the National Nursing Home COVID-19 Network," 2021. Available at: https://www.ahrq.gov/nursing-home/nursing-home-network.html.

25 University of New Mexico, "Project ECHO," 2022. Available at: https://hsc.unm.edu/echo/partner-portal/.

26 S. Arora, K. Thornton, et al., "Outcomes of Treatment for Hepatitis C Virus Infection by Primary Care Providers," *New England Journal of Medicine*, 364: 2199-2207, 2011. Available at: https://doi.org/10.1056/NEJMoa1009370.

27 C. Zhou, A. Crawford, et al., "The Impact of Project ECHO on Participant and Patient Outcomes: A Systematic Review," *Academic Medicine*, 91(10): 1439-1461, 2016. Available at: https://doi.org/10.1097/ACM.0000000000001328.

28 A. J. Damian, S. Robinson, et al., "A mixed methods evaluation of the feasibility, acceptability, and impact of a pilot project ECHO for community health workers (CHWs)." *Pilot and Feasibility Studies*, 6: 132, 2020. Available at: https://doi.org/10.1186/s40814-020-00678-y.

29 RAND Corporation, *Evaluation of Technology-Enabled Collaborative Learning and Capacity Building Models: Materials for a Report to Congress*, 2019. Available at: https://www.rand.org/pubs/research_reports/RR2934.html.

30 Ibid.

31 Center for Health Care Strategies, Inc., *Project ECHO: Policy Pathways for Sustainability*, January 2019. Available at: https://www.chcs.org/media/Project-ECHO-Policy-Paper_011819.pdf.

32 Project ECHO, "ECHO Movement Overview: Reach Metrics," 2022. Available at: https://app.powerbi.com/view?r=eyJrIjoiMWFjYjdiNWYtMzVlMC00OWZmLTg4MDYtMGZhNjE1NzVmNTYyIiwidCI6IjI1YWE5ODMwLWUwZjktNDgyYi04OTdlLTFhM2IzYzg1NWU1YyIsImMiOjZ9&pageName=ReportSection.

33 RAND Corporation, *Evaluation of Technology-Enabled Collaborative Learning and Capacity Building Models: Materials for a Report to Congress*, 2019. Available at: https://www.rand.org/pubs/research_reports/RR2934.html.

34 C. Zhou, A. Crawford, et al., "The Impact of Project ECHO on Participant and Patient Outcomes: A Systematic Review," *Academic Medicine*, 91(10): 1439-1461, 2016. Available at: https://doi.org/10.1097/ACM.0000000000001328.

35 L. Hendrix, "Texas A&M Health Gains 'Superhub' Status," *Vital Record*, September 13, 2021. Available at: https://vitalrecord.tamhsc.edu/texas-am-health-gains-superhub-status/.

36 Centers for Disease Control and Prevention, "Stroke Facts," 2022. Available at: https://www.cdc.gov/stroke/facts.htm.

37 G. C. Fonarow, E. E. Smith, et al., "Improving Door to Needle Times in Acute Ischemic Stroke: The Design and Rationale for the American Heart Association/American Stroke Association's Target: Stroke Initiative," *Stroke*, 42: 2983-2989, 2011. Available at: https://doi.org/10.1161/STROKEAHA.111.621342.

38 B.M. Demaerschalk, J. Berg, et al., "American Telemedicine Association: Telestroke Guidelines," *Telemedicine and e-Health*, 23(5): 376-389, 2017. Available at: https://doi.org/10.1089/tmj.2017.0006.

39 L. Wechsler, et al., "Telemedicine Quality and Outcomes in Stroke: A Scientific Statement for Healthcare Professionals From the American Heart Association/American Stroke Association," *Stroke*, 48: e3-e25, 2016. Available at: https://doi.org/10.1161/str.0000000000000114.

40 A. D. Wilcock, L.H. Schwamm, et al., "Reperfusion Treatment and Stroke Outcomes in Hospitals With Telestroke Capacity," *JAMA Neurology*, 78(5): 527-535, 2021. Available at: https://doi.org/10.1001/jamaneurol.2021.0023.

41 Ibid.

42 K. Jercich, "VA study shows benefits of telestroke program for patients," *Healthcare IT News*, April 2022. Available at: https://www.healthcareitnews.com/news/va-study-shows-benefits-telestroke-program-patients.

43 American Academy of Neurology, "Telemedicine for Stroke Expanded with Passage of FAST Act," February 9, 2018. Available at: https://www.aan.com/PressRoom/home/PressRelease/1618.

44 Public Law 115–123, Bipartisan Budget Act of 2018, 2018. Available at: https://www.congress.gov/115/plaws/publ123/PLAW-115publ123.pdf.

45 A. D. Wilcock, L.H. Schwamm, "Legislation Increased Medicare Telestroke Billing, But Underbilling And Erroneous Billing Remain Common," *Health Affairs*, 41(3), 2022. Available at: https://doi.org/10.1377/hlthaff.2021.00791.

46 Ibid.

47 C. M. Shea, K. Turner, et al., "Implementation Strategies for Telestroke: A Qualitative Study of Telestroke Networks in North Carolina," *Telemedicine and e-Health*, 25(8): 708-716, 2019. Available at: https://doi.org/10.1089/tmj.2018.0131.

48 M. Khurrum, S. Asmar, and B. Joseph, "Telemedicine in the ICU: Innovation in the Critical Care Process," *Journal of Intensive Care Medicine*, 36(12): 1377-1384, 2021. Available at: https://doi.org/10.1177/0885066620968518.

49 Ibid.

50 C. Udeh, B. Udeh, et al., "Telemedicine/Virtual ICU: Where Are We and Where Are We Going?" *Methodist Debakey Cardiovascular Journal*, 14(2): 126-133, 2018. Available at: https://doi.org/10.14797/mdcj-14-2-126.

51 A. Harriot, M. A. DeVita, "The Tele-ICU," *AMA Journal of Ethics*, 2014. Available at: https://journalofethics.ama-assn.org/article/tele-icu/2014-12.

52 C. Udeh, B. Udeh, et al., "Telemedicine/Virtual ICU: Where Are We and Where Are We Going?" *Methodist Debakey Cardiovascular Journal*, 14(2): 126-133, 2018. Available at: https://doi.org/10.14797/mdcj-14-2-126.

53 S. Kumar, S. Merchant, and R. Reynolds, "Tele-ICU: Efficacy and Cost-Effectiveness Approach of Remotely Managing the Critical Care," *Open Medical Informatics Journal*, 7:24-29, 2013. Available at: https://doi.org/10.2174/1874431101307010024.

54 Ascension Health, "TeleICU/Tele Health: Transforming the Delivery of Care," and as further detailed in direct interviews.

55 HIMSS19 Global Conference & Exhibition, *TeleICU: The Strategy That Delivers*, February 2019. Available at: https://365.himss.org/sites/himss365/files/365/handouts/552577955/handout-254.pdf.

56 Avel eCare, "Tele-ICU services," 2022. Available at: https://www.avelecare.com/services/icu/.

57 Healthcare Common Procedure Coding System, "HCPCS Codes G0508," 2017. Available at: https://hcpcs.codes/g-codes/G0508/.

58 S. Jain, R. Khera, et al., "Availability of Telemedicine Services Across Hospitals in the United States in 2018: A Cross-sectional Study," *Annals of Internal Medicine*, 2020. Available at: https://doi.org/10.7326/M20-1201.

59 S. Subramanian and C.M. Palmer "Chapter 11: Cost-Benefit Analysis of Implementing Telemedicine in the ICU," *Telemedicine in the ICU*, 2019. Available at: https://www.intercepttelemed.com/wp-content/uploads/2019/10/Sharing-a-chapter-I-authored-on-Telemedicine-in-the-ICU_1567044697.pdf.

60 A. Vaidya, "How a Not-So-New Concept Buoyed Mayo, Advocate Aurora Amid a Crisis," *mHealth Intelligence*, March 14, 2022. Available at: https://mhealthintelligence.com/features/how-a-not-so-new-concept-buoyed-mayo-advocate-aurora-amid-a-crisis.

61 G. Berlin, M. Lappinte, and M. Murphy, et. al., "Surveyed nurses consider leaving direct patient care at elevated rates," *McKinsey & Company*, February 17, 2022. Available at: https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/surveyed-nurses-consider-leaving-direct-patient-care-at-elevated-rates#.

62 K. Azchrison, K.M. Boggs, et al., "A national survey of telemedicine use by US emergency departments," *Journal of Telemedicine and Telecare*, 26(5): 278-284, 2020. Available at: https://pubmed.ncbi.nlm.nih.gov/30558518/.

63 S. Kumar, S. Merchant, and R. Reynolds, "Tele-ICU: Efficacy and Cost-Effectiveness Approach of Remotely Managing the Critical Care," *Open Medical Informatics Journal*, 7:24-29, 2013. Available at: https://doi.org/10.2174/1874431101307010024.

64 J. Pagan, E. Fisher, et al., "Project ECHO: Misplaced Skepticism Should Not Overtake Its Promise," *Health Affairs*, 2017. Available at: https://doi.org/10.1377/forefront.20170124.058431.

65 Kaiser Family Foundation, *Community Health Center Financing: The Role of Medicaid and Section 330 Grant Funding Explained*, March 2019. Available at: https://www.kff.org/medicaid/issue-brief/community-health-center-financing-the-role-of-medicaid-and-section-330-grant-funding-explained/.

66 National Association of Community Health Centers, "Federal Grant Funding," 2022. Available at: https://www.nachc.org/focus-areas/policy-matters/health-center-funding/federal-grant-funding/.

67 ACP Gastroenterology, "Project ECHO model appears cost-effective for HCV diagnosis, treatment," November 2017. Available at: https://gastroenterology.acponline.org/archives/2017/11/28/3.htm.

68 J. Pagan, E. Fisher, et al., "Project ECHO: Misplaced Skepticism Should Not Overtake Its Promise," *Health Affairs*, 2017. Available at: https://doi.org/10.1377/forefront.20170124.058431.

69 Centers for Medicare & Medicaid Services, "Physician Health Professional Shortage Area Bonuses," 2021. Available at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HPSAPSAPhysicianBonuses.

70 American Hospital Association, "AHA Urges HRSA to Delay Effective Withdrawal Date for HPSAs Designated as 'Proposed for Withdrawal' by at Least One Year," January 2022. Available at: https://www.aha.org/lettercomment/2022-01-24-aha-urges-hrsa-delay-effective-withdrawal-date-hpsas-designated-proposed#:~:text=However%2C%20we%20are%20concerned%20that,of%20all%20primary%20care%20HPSAs.

71 S. Subramanian and C.M. Palmer "Chapter 11: Cost-Benefit Analysis of Implementing Telemedicine in the ICU," *Telemedicine in the ICU*, 2019. Available at: https://www.intercepttelemed.com/wp-content/uploads/2019/10/Sharing-a-chapter-I-authored-on-Telemedicine-in-the-ICU_1567044697.pdf.

72 Ibid.

73 Emory University, "CMS report: eICU program reduced hospital stays, saved millions, eased provider shortage," April 2017. Available at: https://news.emory.edu/stories/2017/04/emory_eicu_program_report/.

74 Ibid.

75 U.S. Department of Health and Human Services, *Report to Congress: Current State of Technology-Enabled Collaborative Learning and Capacity Building Models*, February 2019. Available at: https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//187326/ECHOAct-ConsolidatedReportToCongress.pdf.

76 RAND Corporation, *Evaluation of Technology-Enabled Collaborative Learning and Capacity Building Models: Materials for a Report to Congress*, 2019. Available at: https://www.rand.org/pubs/research_reports/RR2934.html.

77 J. E. McDonough, "Old Wine in a New Bottle—Time for a National Health Care Workforce Commission," *Milbank Quarterly Opinion*, September 15, 2021. https://doi.org/10.1599/mqop.2021.0913

78 Centers for Medicare & Medicaid Services, *Innovation Center Strategy Refresh*, March 2022. Available at: https://innovation.cms.gov/strategic-direction-whitepaper.

79 J. V. Richard, A.D. Wilcock, et al., "Assessment of Telestroke Capacity in US Hospitals," *JAMA Neurology*, 77(8): 1035-1037, 2020. Available at: https://doi.org/10.1001/jamaneurol.2020.1274.

80 J. A. Switzer, B.M. Demaerschalk, et al., "Cost-Effectiveness of Hub-and-Spoke Telestroke Networks for the Management of Acute Ischemic Stroke From the Hospitals' Perspectives," *American Health Association Journal*, 6(1): 18-26, 2013. Available at: https://doi.org/10.1161/CIRCOUTCOMES.112.967125.

81 A. C. MacKinney, M. M. Ward, et al., "The Business Case for Tele-emergency," *Telemedicine and e-Health*, 21(12): 1005–1011, 2015. Available at: https://doi.org/10.1089/tmj.2014.0241.

82 Grantmakers in Health, *Project ECHO*, August 2015. Available at: https://www.gih.org/files/FileDownloads/Project_ECHO_August_2015.pdf.

83 Center for Health Care Strategies, Inc., *Project ECHO: Policy Pathways for Sustainability*, January 2019. Available at: https://www.chcs.org/media/Project-ECHO-Policy-Paper_011819.pdf.

84 NORC at the University of Chicago, *HCIA Complex/High-Risk Patient Targeting: Third Annual Report*, February 2017. Available at: https://downloads.cms.gov/files/cmmi/hcia-chspt-thirdannualrpt.pdf.

85 Milbank Memorial Fund, *Electronic Consultations (eConsults): A Triple Win for Patiens, Clinicians, and Payers*, June 2020. Available at: https://www.milbank.org/wp-content/uploads/2020/06/eConsults_Milbank_Report_v4.pdf.

86 Murkowski.Senate.gov, *The Expanding Capacity for Health Outcomes Act of 2019 (ECHO 2019 Act)*, 2019. Available at: https://www.murkowski.senate.gov/imo/media/doc/ECHO%202019%20Act%20One%20Pager.pdf

87 West Virginia Clinical and Translational Science Institute, "ECHO Act receives critical support in COVID-19 relief bill," 2021. Available at: https://www.wvctsi.org/news/story?headline=echo-act-receives-critical-support-in-covid-19-relief-bill

88 Public Law 116-260, Consolidated Appropriations Act, 2021, 2020. Available at: https://www.congress.gov/116/plaws/publ260/PLAW-116publ260.pdf.

89 A. D. Wilcock, L.H. Schwamm, "Legislation Increased Medicare Telestroke Billing, But Underbilling And Erroneous Billing Remain Common," *Health Affairs*, 41(3), 2022. Available at: https://doi.org/10.1377/hlthaff.2021.00791.

90 Centers for Medicare & Medicaid Services, "Health Care Innovation Awards: Project Profile," 2021. Available at: https://innovation.cms.gov/innovation-models/participant/health-care-innovation-awards/university-of-new-mexico-health-sciences-center.

91 NORC at the University of Chicago, *HCIA Complex/High-Risk Patient Targeting: Third Annual Report*, February 2017. Available at: https://downloads.cms.gov/files/cmmi/hcia-chspt-thirdannualrpt.pdf.

92 Center for Health Care Strategies, Inc., *Project ECHO: Policy Pathways for Sustainability,* January 2019. Available at: https://www.chcs.org/media/Project-ECHO-Policy-Paper_011819.pdf.

93 Bipartisan Policy Center, *What Eliminating Barriers to Interstate Telehealth Taught Us During the Pandemic*, November 2021. Available at: https://bipartisanpolicy.org/explainer/eliminating-telehealth-barriers/.

94 B.M. Demaerschalk, J. Berg, et al., "American Telemedicine Association: Telestroke Guidelines," *Telemedicine and e-Health*, 23(5): 376-389, 2017. Available at: https://doi.org/10.1089/tmj.2017.0006.

95 S. Kumar, S. Merchant, and R. Reynolds, "Tele-ICU: Efficacy and Cost-Effectiveness Approach of Remotely Managing the Critical Care," *Open Medical Informatics Journal*, 7:24-29, 2013. Available at: https://doi.org/10.2174/1874431101307010024.

96 RAND Corporation, *Evaluation of Technology-Enabled Collaborative Learning and Capacity Building Models: Materials for a Report to Congress*, 2019. Available at: https://www.rand.org/pubs/research_reports/RR2934.html.

97 Change Healthcare, "Leader or Laggard: See Where Your Organization Stands in the Coming API Revolution," 2021. Available at: https://www.changehealthcare.com/insights/state-of-healthcare-apis.

98 The Office of the National Coordinator for Health Information Technology, *The Trusted Exchange Framework and Common Agreement*, 2019. Available at: https://www.healthit.gov/sites/default/files/page/2019-04/ONC-TEFCA_FINAL_InfoSheets_Developers.pdf.

1225 Eye St NW, Suite 1000
Washington, DC 20005

bipartisanpolicy.org

202 - 204 - 2400

The Bipartisan Policy Center (BPC) is a Washington, D.C.-based think tank that actively fosters bipartisanship by combining the best ideas from both parties to promote health, security, and opportunity for all Americans. Our policy solutions are the product of informed deliberations by former elected and appointed officials, business and labor leaders, and academics and advocates who represent both ends of the political spectrum.

BPC prioritizes one thing above all else: getting things done.

@BPC_Bipartisan
facebook.com/BipartisanPolicyCenter
instagram.com/BPC_Bipartisan

Policy Areas

- Business
- Campus Free Expression
- Economy
- Education
- Elections
- Energy
- Governance
- Health
- Housing
- Immigration
- Infrastructure
- Technology

Bipartisan Policy Center

1225 Eye Street NW, Suite 1000
Washington, D.C. 20005

IDEAS. ACTION. RESULTS.