



# Narrowing the rural-urban health divide

Bringing virtual health to rural communities

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Deloitte Consulting's Virtual Health practice helps clients assess the transformative opportunities that can be possible through the use of virtual health, determines which capabilities would best serve their customer or patient populations, and aligns potential solutions to their strategic imperatives. Our work helps health care organizations build a scalable virtual health program that fits their needs, deploys strategic capabilities, and aligns capabilities to care delivery pathways. Our practice brings insights from leaders across the industry with experience in strategy, operations, human capital, technology, and a foundation in clinical and operational experience.

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# Executive summary

Access to health care ranks among the top challenges facing rural communities today due to provider shortages, long travel distances, and the acceleration of hospital closures in recent years. While not a panacea, virtual health can address many of these issues, and in turn, help narrow the rural-urban health divide—the stark disparity between access to care and the overall health of citizens in rural areas compared to their urban counterparts.

IN THIS REPORT, we lay out some of the key steps rural health care organizations—including critical access hospitals, federally qualified health centers, rural health clinics, and tertiary care facilities—should consider when delivering virtual health in rural settings, and what government can do to support and enable rural communities in this capacity. Our analysis is based on interviews with more than a dozen rural health care experts and reviews of secondary literature.

Below are six key steps leaders of health care organizations should consider as they build their virtual health programs:

- **Conduct a needs assessment.** Before starting a virtual health program, leaders should conduct a needs assessment of the organization and the population it serves to identify the most appropriate virtual health solutions, current technological capabilities, future technological needs, and how to bridge the gap.
- **Develop a strategy, governance structure, and partnerships.** Having a coordinated strategy and a centralized governance structure within the health care organization are critical to the success of any virtual health program. In addition, organizations should build partnerships and networks with other entities.
- **Invest in data and technology infrastructure.** Hardware and software investments are core to any virtual health program, but health care organizations should also pay attention to interoperability and investments that should be made in cognitive technologies and analytics.
- **Engage with and train your workforce.** Making virtual health a mainstream aspect of rural care will require significant buy-in from—and investment in—the health care workforce. To help win over key stakeholders, leaders can emphasize the benefits to patients and clinicians and teach the workforce to use the new technology.
- **Create new workflows, care models, and risk mitigation protocols.** Virtual health should be integrated into a seamless and coordinated delivery process across different providers, services, and settings.
- **Engage with and educate patients.** Just like clinicians, patients should be educated on the benefits of virtual health, and how to use the new technology.

While health care organizations will need to take the lead, they won't be able to do it alone. In order to see the potential of virtual health realized, public and private organizations should work together to align incentives, leverage scarce resources, share best practices, and create economies of scale. The

role of government is critical as well. By helping to build connectivity, simplifying the process of applying for funding, and driving the adoption of value-based care, government agencies can enable and support rural communities as they use virtual health to help bridge the rural-urban health divide.



# Virtual health

## The opportunity for rural communities

**M**ARTINA WAS BORN in a hospital in rural Nebraska. Shortly after her birth, her doctors detected a pneumothorax, or collapsed lung. Neonatal events like these sometimes require an intervention; other times they heal on their own—a call that a neonatal specialist needs to make. But this rural hospital wasn't equipped to handle rare conditions such as the one Martina was experiencing, and no such specialist was on hand.

The standard protocol would have been to put Martina in a helicopter and transport her to the nearest tertiary care facility, more than 150 miles away, so that a specialist could assess whether an intervention was, in fact, needed. Luckily, the local hospital had just joined a virtual hospital service: Martina's parents were given the option to have a remote neonatal intensive care unit (NICU) physician monitor the newborn via two-way video conference.

They chose this option. As a result, Martina was able to fully recover with very little treatment, and has grown into an active and healthy toddler. Her

parents were able to stay in their community with their three other children, rather than being separated from their newborn and having to travel long distances each time they went to see her in the NICU. And thousands of dollars were saved in helicopter transfer costs.<sup>1</sup>

This story is emblematic of some of the challenges facing rural communities, and how virtual health could improve health care access for rural residents. Virtual health services can also offer important benefits to the health care system more broadly: the opportunity for rural clinicians to learn from specialists, and for rural hospitals to retain vital revenue and enhance the quality of their services. Moreover, a growing number of studies have shown that virtual health can improve health outcomes, reduce costs, reduce unnecessary utilization (such as nonurgent visits to the emergency room), improve adherence to medication and other protocols, and improve patient satisfaction. (See the appendix for a summary of studies documenting the impact of virtual health.)

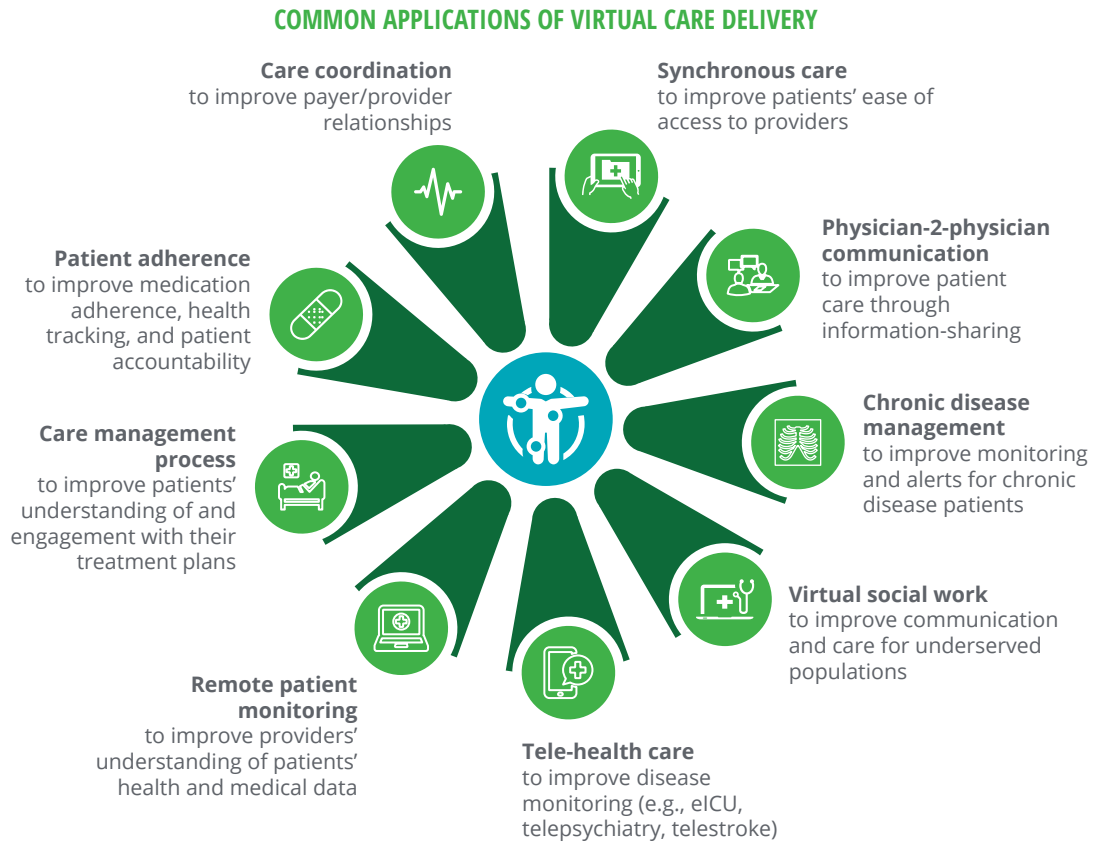
### WHAT IS VIRTUAL HEALTH?

Virtual health refers to the delivery of health services in a way that is independent of time or location using enabling technology, such as video conferences, mobile apps, in-home sensors, text-based messaging, and analog telephones. Virtual health visits can take place between a patient and his/her clinician, or between clinicians. But virtual health goes beyond video conferences (synchronous visits) to include remote patient monitoring, email/telephone communication, and store-and-forward technology (asynchronous visits, in which data such as MRI scans or photos of a rash are captured and sent to medical professionals via a secure and encrypted internet connection). With applications designed to drive connected, coordinated care, virtual health can complement, or substitute for, in-person care as appropriate (figure 1). These applications present a critical opportunity for rural areas to receive improved access to care.

FIGURE 1

## Virtual health applications drive connected, coordinated care

How virtual health applications can help stakeholders access data more easily, improve quality of care, and deliver value to patients



Source: Deloitte analysis.

# How can virtual health help rural communities?

**A**MONG THE MANY issues impacting rural America, access to health care and related health disparities rank among the top (figure 2). A recent spike in hospital closures has exacerbated these issues, as more health care professionals in rural areas already experiencing provider shortages have left to find jobs elsewhere. This has resulted in many rural residents needing to travel even longer distances to receive care, and has increased access barriers to both specialty *and* primary care because hospital emergency departments are a major source of primary care in rural communities.<sup>2</sup> Among the hardest hit have been elderly and low-income populations; both are more likely to delay or forego needed care because of transportation challenges. What's worse, the trend in rural hospital closures is expected to continue.<sup>3</sup>

**Virtual health has been identified as one part of a suite of new health care models that could help address rural health needs and narrow the rural-urban health divide.**

Virtual health has been around in some form for decades. However, due to advances in digital technologies,<sup>4</sup> an increasingly supportive policy landscape,<sup>5</sup> and a growing evidence base showing its effectiveness (see appendix), implementing it now makes more sense than ever. Nevertheless, successful implementation of virtual health into mainstream health care systems has been slow.

There are several forms of virtual health that can be used in lieu of, and in addition to, in-person visits to alleviate various rural health challenges, including provider shortages, and time, distance, and transportation barriers. These include virtual

visits, store-and-forward technology, and email/telephone communication (see sidebar, “*What is virtual health?*”). Virtual visits can be used to address specialty provider shortages by connecting groups of community providers with specialists at centers of excellence in real-time sessions. This allows specialists to share their medical knowledge and expertise with on-site clinicians, helping them diagnose and determine a course of treatment for a patient.

Finally, health care organizations can use remote patient monitoring (RPM) to track the vital signs of people who require chronic, postdischarge, or senior care, allowing them to keep track of patient data between visits and intervene with medication adjustments or other treatment recommendations *before* a patient requires urgent medical attention. Using virtual health as a preventive care tool can help reduce the number of unmonitored chronic conditions that become urgent episodes. Given that rural areas have a higher prevalence of chronic disease,<sup>6</sup> RPM can be especially effective at preventing adverse events and maintaining continuity of care in these settings.

**Virtual health can also help rural residents maintain privacy and confidentiality, while overcoming the stigma associated with certain health conditions.**

In small, tight-knit communities, individuals with a behavioral health condition may know the local behavioral health specialist personally—if their community is lucky enough to have such a specialist. Some may be reluctant to seek help for their condition because of privacy and confidentiality concerns, and due to the stigma still often associated with these



conditions. The ability to receive treatment from a professional outside the community may encourage an individual with these needs to seek care.<sup>7</sup>

**Rural patients who have tried virtual health generally report high satisfaction.** According to a recent survey of life in rural America, one-quarter (24 percent) of rural adults have used

FIGURE 2

### A snapshot of rural and urban America: Population characteristics and leading health indicators<sup>8</sup>

	Rural (nonmetropolitan)	Urban (metropolitan)
<b>Population characteristics</b>		
Population (% in 2015) <sup>9</sup>	14.3	85.7
People aged 65 and over (% in 2017) <sup>10</sup>	18.1	14.3
Household income (median in 2014) <sup>11</sup>	US\$43,616	US\$58,229
<b>Access to care</b>		
Primary care physicians per 10,000 people (2014) <sup>12</sup>	5	8
Total physicians per 10,000 (2014) <sup>13</sup>	13	33
Percentage saying access to good doctors and hospitals is a major problem in their local community (2018) <sup>14</sup>	23	18
Longest average drive time to the nearest hospital, in minutes (2018) <sup>15</sup>	34	18.7
<b>Health status</b>		
Diagnosed diabetes prevalence (% in 2016) <sup>16</sup>	12.6	9.9
Obesity prevalence (% in 2016) <sup>17</sup>	33.5	28
Preventable hospitalization (hospital stays for ambulatory-care sensitive conditions per 1,000 Medicare enrollees in 2013) <sup>18</sup>	64.6	50.6
<b>Mortality<sup>19</sup> (age-adjusted rate per 100,000 in 2014)</b>		
All-cause	830.5	703.5
Suicide	16.8	12.4
Drug poisoning	15.6	14.7

Source: Deloitte analysis.

telehealth to obtain prescriptions and manage chronic conditions, and among them, the vast majority report satisfaction (90 percent).<sup>20</sup> The most common reason rural Americans give for

using telehealth is convenience (69 percent), followed by inability to see a regular doctor in person (30 percent), and difficulty traveling to a doctor/hospital (26 percent).<sup>21</sup>

## METHODOLOGY

To get insights into what rural health care organizations should be doing to expand virtual health, the Deloitte Center for Government Insights interviewed more than a dozen rural health care experts with experience in virtual health. Interviewees included leadership from hospital systems, federally qualified health centers (FQHCs), health technology companies, broadband providers, academic institutions, advocacy groups, policy institutes, and philanthropic organizations. We used the findings from our interviews as well as secondary sources to offer practical recommendations to health care organizations and government agencies as they plan and implement virtual health programs in rural areas.

**Note:** We largely set aside reimbursement and clinician licensure policies in this paper and during our interviews because these issues have been covered extensively in other literature on virtual health, and because the policy landscape around these issues is rapidly evolving and varies greatly by state and insurance type.

# Planning and implementing a virtual health program

Key steps for health care organizations

FIGURE 3

## Implementing a virtual health program

Six key steps health care organizations should take



Source: Deloitte analysis.

## Conduct a needs assessment

**Before starting a virtual health program, health care organizations should conduct a needs assessment to identify organizational and population needs.** This can help leaders determine whether virtual health solutions can help address the specific needs of their population, and if so, which solutions are most appropriate. Health care organizations should draw on existing evidence to assess the impact of potential virtual health solutions, looking at current technological capabilities and future technological needs, and how to bridge that gap (both within the organization and among the population being served).

For example, access to high-speed internet is a problem for roughly one in five rural adults (21 percent).<sup>22</sup> This may limit the ability of rural residents to access virtual health, and the ability of rural providers to deliver it. Still, several people we spoke with told us that many forms of virtual health require only a smartphone with cellular service (which, in some cases, is also difficult to access), an intermittent internet connection, or a landline telephone, depending on the virtual health solution. “Remote patient monitoring can be as simple as setting up an interactive voice response system and having a patient or caregiver enter or report their daily blood pressure or heart rate using an analog phone—it can be done in online or offline mode,” said Bill Paschall, vice president of business development at Vivify Health, a company that offers remote patient monitoring solutions to health care organizations throughout the country. Health care organizations should take the technological capabilities of their populations into account when designing their virtual health programs, recognizing that low-cost solutions are also available.

As they get started, health care organization leaders should also reach out to federally-funded national and regional telehealth resource centers (TRCs).

The Office of Advancement of Telehealth established 12 regional and two national TRCs to expand the availability of health care to underserved populations through virtual health. Each TRC is staffed with experts in policy, technology evaluation, operational implementation, technical assistance, and knowledge of funding sources. In addition, because they are federally funded, their services are generally provided free of charge.<sup>23</sup>

## Develop a strategy, governance structure, and partnerships

**A coordinated strategy and centralized governance are critical to the success of any virtual health program.** The decision to implement a virtual health program should come from executive leadership and be part of the organization’s strategic vision. Organizations should earmark time and resources for the initiative and develop centralized governance structures inside the organization, with a clear delineation of decision rights and responsibilities, operational champions, and an integrated roadmap. This can enable leadership and clinical staff to be engaged and aligned on the vision for virtual health and how to get there as an organization.<sup>24</sup>

“Ensure there is a solid strategic plan for what needs to be implemented. You need clinician buy-in, leadership buy-in, and a stated vision of virtual health for the organization.”

— Tim Polley, interim vice president,  
enterprise strategy and development,  
Carle Foundation Hospital

**At the same time, organizations should build networks with other health care providers.** According to experts we spoke with, this is especially critical in rural communities due

to provider shortages, long distances to sites of care, varying access to the internet, low patient volume, and slim operating margins. As mentioned, rural health care providers, such as critical access hospitals (CAHs) and Federally Qualified Health Center (FQHCs) may need to establish networks, often with tertiary care centers that are geographically distant, to deliver specialty care services to their local populations.

Beyond sharing clinical resources, however, partners can also share technological capabilities and data infrastructure. For example, the Finger Lakes Telehealth Network provides open access to its telehealth infrastructure and support resources to partnering organizations in exchange for a small subscription fee. This arrangement allows for a collaborative sharing of services as well as cost savings to providers.<sup>25</sup> These networks often help members develop the required broadband infrastructure, usually for a discounted rate, and can provide access to data analysts and other experts that may be needed to deliver certain virtual health services (see section below on data and technology infrastructure).

“We’re talking about small communities with smaller budgets. For us, buying equipment is a big deal. Rolling out a new program is a big deal ... We have no choice but to collaborate. With networks and partnerships, we have shared risk and responsibility.”

— Mary Zelazny, chief executive officer,  
Finger Lakes Community Health

**Public-private partnerships can be an effective way to establish local sites of care to address issues related to internet access or privacy concerns.** Many individuals, including those who have slow or inconsistent internet access, and those who lack access to a private space inside their home, may need to go to a site outside their home for virtual sessions. Accessing Telehealth through Local Area Stations

(ATLAS), a veterans affairs (VA) initiative designed to enhance access to VA health care through virtual health, has teamed up with Walmart to deliver video sessions to veterans. Established in fall 2019, the pilot sites were created to offer a convenient, comfortable, and private space with strong internet connectivity in communities where veterans often have long travel times to VA facilities and/or poor connectivity at home.<sup>26</sup> Other locations that can serve similar functions include libraries and schools (see sidebar, “*North Carolina is building Health-e-Schools*”).<sup>27</sup> Developing innovative partnerships can help rural communities make the most of limited resources.

## Invest in data and technology infrastructure

**Hardware and software investments are core to any virtual health program, but health care organizations should also pay attention to interoperability and investments that should be made in cognitive technologies and analytics.**

Hardware and software investments can vary, depending on the type of virtual health solution. A basic virtual visit could be enabled by a simple digital camera and an audio/video software platform.<sup>28</sup> Other solutions may require more sophisticated technology. For example, a specialized examination tool with an integrated high-resolution camera may be necessary for one medical professional to capture and transmit the image of the inside of a patient’s ear to another professional.<sup>29</sup>

While the need to make hardware and software investments may be obvious, less so is the need to build interoperability, security, and analytics into every aspect of the virtual health program. Doing so should not be an afterthought, but rather, baked into the vision of a seamless, patient-centered virtual health program. Interoperability allows data from the virtual visit to be sent to the patient’s

## NORTH CAROLINA IS BUILDING HEALTH-E-SCHOOLS

In four counties in western North Carolina, elementary, middle, and high school students can receive virtual primary care at school through a program called “Health-e-Schools.” With the help of a school nurse, high-definition video conferencing, and specially equipped stethoscopes and cameras, students can receive a range of physician-supervised services, including sports physicals, behavioral health services, and consultations for respiratory issues.

The program was created in 2011 by the Center for Rural Health Innovation (CRHI), with support from BlueCross and BlueShield North Carolina Foundation and grants from Health Resources and Services Administration (HRSA) and United States Department of Agriculture (USDA), among others.<sup>30</sup> CRHI is a nonprofit whose mission is to apply innovative technologies to improve access to health care in rural communities.<sup>31</sup> It created Health-e-Schools after recognizing that traditional sites of care are often geographically distant from where students live and go to school. A parent might have to take several hours off from work to bring their child to a health care facility, while the student would miss several hours of school—both of which could present strong barriers to accessing health care. School-based health centers have been shown to improve attendance and reduce barriers to learning, and Health-e-Schools has increased classroom attendance for students and decreased time spent away from work for parents and caregivers.<sup>32</sup>

primary care clinician or medical team and integrated into their electronic health record (EHR). Meanwhile, organizations need to ensure that systems are protected and that data is not intentionally or unintentionally compromised, altered, or made public.

“I should know if my patient used Teledoc, and the outcome of that visit. Virtual health should contribute to seamless care, not drive further fragmentation.”

— Dr. Steve North, founder and medical director,  
Center for Rural Health Innovation

**Virtual health solutions such as remote patient monitoring (RPM) may require investments in cognitive and analytic capabilities.** RPM involves the use of smart devices to provide real-time data to health care teams on vital health measurements such as blood pressure and heart rate. Algorithms are used to process data streams and notify a patient’s health care team if a problem arises that requires analysis or intervention. Health care organizations should invest not only in the software, but also in the workforce needed to continuously run and update

such algorithms and analyze the data. Rural health care providers may face significant challenges finding such talent locally, and may not be able to afford to pay competitively for such a position. In such cases, leveraging partnerships, as discussed above, is key.

## Engage with and train your workforce

**Making virtual health a mainstream aspect of rural care will require significant buy-in from—and investment in—the health care workforce.** Rural clinicians may have a keen sense of the health care challenges facing their communities, but may not necessarily trust that virtual health can help solve these issues. Sharing the evidence base on virtual health effectiveness with respect to outcomes, quality, and patient experience, in addition to real-life stories on how it has made patients’ lives easier, are important first steps to gaining clinician buy-in. However, it’s also important to emphasize how clinicians themselves can benefit. Virtual visits between specialists and primary care clinicians allow specialists in rural

areas to care for a broader range of acutely ill or complex patients than they would otherwise have access to, keeping their skills sharp and continuing their practical education.<sup>33</sup> Connections made through virtual health also allow rural providers to become part of a broader community of clinicians, helping to decrease feelings of professional isolation.<sup>34</sup> Once engaged, some clinicians may emerge as champions, rallying peers to get onboard with virtual health, too.

**But engagement is only half the story. The workforce should also be trained to use these new technologies.** According to a [2018 physician survey from the Deloitte Center for Health Solutions](#), more than half (51 percent) of physicians say that training on a new technology is necessary to support its adoption. But training isn't simply about getting clinicians comfortable with the new technology and modified workflow. It's also about teaching them how to modify their bedside manner—or “websites” manner—to build rapport with patients in virtual interactions, provide them with knowledge of the legal and clinical limitations of virtual health, teach them competencies in virtual examination using the patient or on-site family members,<sup>35</sup> and make sure they know what to do if an emergency arises. This training may happen formally, either in continuing education classes or it can be engrained into medical school curricula. It can also happen more informally, as technologically sophisticated clinicians or identified “super users” provide hands-on training and mentoring to their hesitant colleagues.

## Create new workflows, care models, and risk mitigation protocols

**Virtual health should be integrated into a seamless and coordinated delivery process**

**across different providers, services, and settings.** Once health care organizations gain workforce buy-in, they need to sustain that buy-in by ensuring that delivering virtual health doesn't create additional work or inefficiencies.<sup>36</sup> The goal is to explicitly integrate virtual health into mainstream care delivery so that it becomes as routine as in-person visits.

At Carle Health System, registered dietitians in the nutrition service department have dedicated virtual days or half-days where they go to the “virtual health room” in the clinic and see patients virtually.<sup>37</sup> Blocking off time on their calendars helps other providers, administrative staff, and patients know when the dietitians are available for virtual visits. Additionally, having a dedicated room ensures that the necessary equipment will be available, and privacy and security concerns are addressed. When planning to adjust staffing and operational workflows, consider conducting interviews and simulations with clinicians, administrative staff, and patients so that all perspectives and experiences are incorporated into the new workflow. This can help create a more human-centered design and experience.

**Risk mitigation and clinical escalation paths should also be integrated into virtual health workflows.** An unexpected emergency can take place during any virtual visit, but the risks may be higher in rural areas where distances to the nearest emergency room or site of care may be greater. Health care organizations should develop protocols for connecting patients experiencing emergencies with clinical support, regardless of whether the patient is in their own home, a retail clinic, or a virtual health center. Additionally, if the electricity goes out or there are other technological difficulties during a virtual visit, there should be protocols in place to continue or reschedule the visit as necessary that are known to clinicians and communicated to patients.

## Engage with and educate patients

**Just like clinicians, patients should be educated on the benefits of virtual health, and how to use it.** Eighty-five percent of rural Americans use the internet. They do so to get health information, manage their finances, and carry out business-related activities. But only one-quarter (24 percent) of rural adults have ever had a virtual visit.<sup>38</sup> This could be because virtual health visits are not available to them, they don't trust the quality of care they might receive, worry that they won't know how to initiate or interact in a virtual visit, or don't know that the service is available. Just like clinicians, patients should be told about the availability of virtual health services, educated about the benefits and effectiveness of virtual health, and shown how to use some of the technology, such as patient-operated digital

stethoscopes.<sup>39</sup> Clinicians themselves can play a key role in informing their patients that they offer virtual health services, showing them how it works, and telling them what kind of equipment they might need.<sup>40</sup> Whenever possible, health care organizations should ensure that patients see the same clinician during virtual and in-person visits. This consistency can help maintain a personalized clinician-patient relationship, which is a top priority for many patients.<sup>41</sup>

“We need to educate and empower patients, and keep in mind that people have different levels of comfort with virtual health. Meet the patient where they are in terms of understanding and comfort.”

— Jennifer Farrell, senior director, global market development, Medtronic Care Management Services



# How government can help

**H**EALTH CARE ORGANIZATIONS should drive the adoption of virtual health solutions; however, there are a variety of actions federal, state, and local governments can take to accelerate the adoption of virtual health in rural areas. Below, we discuss the role government agencies can play in helping rural communities implement virtual health programs.

## Building connectivity

The federal government has developed several programs to help bring broadband to rural communities. Among them are the Federal Communications Commission's (FCC) Rural Health Care Program, which provides funding to eligible health care providers for telecommunications and broadband services,<sup>42</sup> and the USDA's ReConnect Loan and Grant Program, a pilot program authorized by the Consolidated Budget Act of 2018 to facilitate broadband deployment in rural areas that lack sufficient access.<sup>43</sup>

But local governments and communities should also explore creative infrastructure deployment strategies that go beyond broadband networks offered by private companies. These can include wireless (4G and soon, 5G), low earth orbit,<sup>44</sup> and municipal internet, in which a municipal electrical provider lays down fiber-optic cables next to existing electrical wires. The cost of municipal internet is often well below that of large internet providers. And while more than 150 communities in 29 states have publicly owned municipal networks offering at least 1-gigabit services, 19 states have laws in place discouraging or preventing local communities from making such investments.<sup>45</sup> Finally, state and local governments

should establish formal mechanisms to coordinate broadband efforts across the state and share best practices for rural infrastructure development. Such efforts can also help unlock new economic value and [enable rural communities to reach their full potential in a digitally connected world](#).

## Simplifying the process for applying for funding

Nonprofit organizations and health care providers in rural areas typically rely on government and state funders as well as foundations to help launch or sustain virtual health projects. However, getting a grant is resource-intensive and often complicated. Funders hold competitive cycles for grant programs in which rural organizations must sometimes compete against well-funded, well-prepared organizations with dedicated and experienced grant writing teams. Organizations in rural areas are less likely to have staff members strictly dedicated to grant writing, and even when rural communities seek to tap some of those resources, it is not always obvious which programs they may be eligible for.<sup>46</sup> Conducting research on dozens of programs to zero in on the most likely prospect often takes more labor than a small, resource-strapped rural organization can commit.

Government agencies should simplify their rural health funding programs to make it easier for communities to establish these essential services. One option is for agencies to create a government funding portal for health care organizations to use to access information about programs and apply for funding. After entering their relevant data into the portal, a health care organization would be presented with a streamlined list of grants and funding opportunities for which it is eligible, and

links to the organization's regional telehealth resource center for additional assistance.

## Driving value-based care

Issues related to whether and how virtual health is currently reimbursed by various payers were explicitly set aside for this paper; however, they inevitably came up during many of our interviews. Several rural health experts we interviewed expressed skepticism about the widespread adoption of virtual health until the shift from fee-for-service to value-based care (VBC) was more broadly adopted in rural areas. They mentioned that many hospitals are currently incentivized to keep their hospital beds full rather than provide preventive care through virtual visits, RPM, and other forms of virtual health.

Currently, accountable care organizations and other value-based payment (VBP) models are less prevalent in rural areas,<sup>47</sup> as they often lack

sufficient patient volumes and the core capabilities needed to succeed. Recognizing these challenges, the National Rural Health Association, along with other partners, has developed draft legislation to establish a critical access hospital VBP program, which would give critical access hospitals an on-ramp into VBP models and help them to assume more financial risk over time.<sup>48</sup> By supporting and enabling value-based care delivery in rural settings, government agencies can create the right financial incentives and the business case for rural providers to integrate virtual health into a mainstream delivery model.

"We're seeing the incentives change, which has encouraged providers to move away from the fee-for-service mentality and instead look upstream and prioritize preventive services. You *can* herd cats, you just need to move the food."

— Brock Slabach, senior vice president of member services at the National Rural Health Association

# Conclusion

**R**URAL HEALTH CARE challenges are nothing new, but the recent acceleration of rural hospital closures threatens to increase rural and urban health disparities, even beyond what they've been historically. Virtual health is one tool among many that can help address these challenges.

With leadership from rural health care organizations, support from government agencies, and collaboration with other public and private entities, virtual health can help bridge the rural-urban health divide and allow rural residents and providers to reap the benefits of technology-assisted health care delivery.



# Appendix

## Research findings

FIGURE 4

### The impact of virtual health on health outcomes, cost, utilization, and patient satisfaction

MEASURE	ORGANIZATION	FINDINGS
Outcomes	Pacific Northwest Evidence-based Practice Center <i>Meta-analysis</i>	"A large volume of research reported that <b>telehealth interventions produce positive outcomes</b> . The most consistent benefit has been reported when telehealth is used for communication and counseling or remote monitoring in chronic conditions, such as cardiovascular and respiratory disease, with improvements in outcomes such as <b>mortality, quality of life, and reductions in hospital admissions.</b> "
Outcomes (mortality)	Department of Biomedical and Health Information Sciences, University of Illinois at Chicago <i>Meta-analysis</i>	"Evidence from high-quality reviews with meta-analysis indicated that taken collectively, <b>home telemonitoring interventions reduce the relative risk of all-cause mortality and heart failure-related hospitalizations</b> compared with usual care. Absolute risk reductions ranged from 1.4 percent to 6.5 percent and 3.7 percent to 8.2 percent, respectively."
	E-Health Center, University of Michigan Health System et al. <i>Meta-analysis</i>	"Telemonitoring was significantly associated with <b>reductions in mortality ranging from 15 percent to 56 percent</b> compared with patients undergoing 'usual' care... The various modalities of telestroke have been demonstrated to <b>reduce mortality in the range of 25 percent</b> during the first year after the event."
Outcomes (adherence)	Good Samaritan/Union Memorial Hospital et al. <i>Meta-analysis</i>	"Current evidence suggests that mHealth tools <b>can improve medication adherence</b> in patients with cardiovascular diseases."
	Centre for Cardiovascular and Chronic Care, Faculty of Health, University of Technology Sydney <i>Meta-analysis</i>	" <b>Adherence was rated between 55.1 percent and 98.5 percent</b> for those structured telephone support and telemonitoring studies which reported this outcome... Seven of nine studies that measured these outcomes reported <b>significant improvements in heart failure knowledge and self-care behaviors.</b> "
Outcomes (quality of life)	Centre for Global eHealth Innovation, University Health Network	"The change in <b>quality of life from baseline to post-study... was significantly greater for the telemonitoring group</b> compared to the control group. A between-group analysis also found greater post-study self-care maintenance... for the telemonitoring group."
	University of Michigan Health System et al. <i>Meta-analysis</i>	"The published scientific literature on TMH [telemental health] reveals strong and consistent evidence of the feasibility of this modality of care and its acceptance by its intended users, as well as <b>uniform indication of improvement in symptomology and quality of life among patients</b> across a broad range of demographic and diagnostic groups."

MEASURE	ORGANIZATION	FINDINGS
Cost	NTCA–The Rural Broadband Association	<b>National average estimates of cost savings (per medical facility, annually)</b> include: <ul style="list-style-type: none"> <li>• Travel expense savings: US\$5,718</li> <li>• Lost wages savings: US\$3,431</li> <li>• Hospital cost savings: US\$20,841</li> </ul>
	E-Health Center, University of Michigan Health System et al. <i>Meta-analysis</i>	“The evidence supports the <b>economic benefits of telemonitoring compared with usual care</b> among patients with CHF, stroke, and COPD.”
	Sidney Kimmel Medical College of Thomas Jefferson University	“ <b>Net cost savings per telemedicine visit</b> was calculated to range from <b>US\$19 to US\$121 per visit.</b> ”
	University of Pittsburgh Medical Center (UPMC)	“The initial analysis compared the use of an AnywhereCare online, virtual visit with the cost of an emergency department, urgent care, retail clinic, or primary care office visit and <b>showed a potential savings of US\$86.64 per episode of care.</b> ”
	Alliance for Connected Care	“Assuming that a telehealth visit costs approximately US\$50/visit, the <b>estimated savings per commercial telehealth visit are US\$126.</b> ”
	Humana–Doctor on Demand	“ <b>Telehealth visits only cost an average of US\$38</b> , compared to an average of US\$114 for a visit to the doctor’s office.”
Utilization	University of Pennsylvania Health System et al.	“Year one [fiscal year 2012] all-cause 30-day readmission rate was 19.3 percent. Fiscal year 2015 ended with an all-cause 30-day readmission rate of 5.2 percent, a <b>reduction by 14 percentage points (a 73 percent relative reduction) in three years.</b> Telehealth is now an integral part of the University of Pennsylvania Health System’s readmission reduction program.”
	University of Ottawa	“Telehome monitoring <b>significantly reduced the number of hospital readmissions and days spent in the hospital</b> for patients with angina and improved quality of life and functional status in patients with heart failure or angina. Patients found the technology easy to use and expressed high levels of satisfaction.”
	Alignment Healthcare	“Alignment members enrolled in remote monitoring across all markets saw hospital <b>readmission rates of 7.2 percent</b> ... These rates are compared to the national Medicare <b>average readmission rate of about 18 percent.</b> ”
	E-Health Center, University of Michigan Health System <i>Meta-analysis</i>	“Generally, the benefits include reductions in use of service: hospital <b>admissions/readmissions, length of hospital stay, and emergency department visits typically declined.</b> It is important that there often were reductions in mortality.”
	Department of Psychiatry, Yale School of Medicine	“Between 2006 and 2010, <b>psychiatric admissions of telemental health patients decreased</b> by an average of 24.2 percent (annual range 16.3 percent to 38.7 percent), and the <b>patients’ days of hospitalization decreased</b> by an average of 26.6 percent (annual range 16.5 percent to 43.5 percent).”

MEASURE	ORGANIZATION	FINDINGS
Patient satisfaction	Brigham and Women's Hospital	"Among patients surveyed after their initial encounter, <b>97 percent were satisfied</b> with the experience and would recommend the program, and <b>74 percent felt that the interaction actually improved their relationship with their provider</b> , allaying some of our concerns that what patients would gain in convenience they would lose in a remote interaction."
	Centre for Cardiovascular and Chronic Care, Faculty of Health, University of Technology Sydney <i>Meta-analysis</i>	"Structured telephone support and noninvasive home telemonitoring demonstrated improvements in health-related quality of life and heart failure knowledge and self-care behaviors. Studies also demonstrated <b>participant satisfaction with the majority of the interventions</b> which assessed this outcome."
	Sidney Kimmel Medical College of Thomas Jefferson University	" <b>Seventy-four percent had their care concerns resolved</b> on the telemedicine visit."
	Alliance for Connected Care	"Patient <b>issues are able to be resolved</b> during the initial telehealth visit an average of <b>83 percent</b> of the time."
	Nursing and Health Professions, State College of Florida et al.	" <b>Mean ED wait time for the telehealth [behavioral health consultation] cohort was significantly shorter</b> at 12 minutes compared to a mean time of 27 minutes for the nontelehealth case controls."

Source: Deloitte analysis.

## Endnotes

1. This is based on a true account of events faced by one family. We have changed names and other specific details to protect individuals' privacy.
2. Jane Wishner et al., "A look at rural hospital closures and implications for access to care: Three case studies," Kaiser Family Foundation, July 7, 2016.
3. Ibid.
4. Rural Health Information Hub, "Rural data explorer," accessed October 17, 2019; HRSA Area Health Resources Files, 2014 and 2015. No statistical tests were run to compare rural and nonrural measures.
5. Ibid.
6. Kim Parker et al., "Views of problems facing urban, suburban and rural communities," Pew Research Center, May 22, 2018. Pew Research's analysis includes urban, suburban, and rural communities. Our table includes data on urban and rural communities only. Differences between urban and rural are statistically significant.
7. Onyi Lam, Brian Broderick, and Skye Toor, "How far Americans live from the closest hospital differs by community type," Pew Research Center, December 12, 2018. Pew Research's analysis includes urban, suburban, and rural communities. Our table includes data on urban and rural communities only. Differences between urban and rural are statistically significant; longest average minutes refers to those whose travel time to the nearest hospital is above the 75th percentile for their community type.
8. There are several different ways to measure rurality, and rural-urban comparisons using different definitions may yield different conclusions. In this table, data from the Rural Health Information Hub and from the North Carolina Health Research Program categorize counties as metropolitan and nonmetropolitan using the Office of Management and Budget metropolitan and micropolitan statistical area definitions. According to this definition, nonmetro counties include noncore (small rural) and micropolitan (large rural) counties. The Pew Research Center asked survey respondents to describe the area in which they live as rural, suburban, or urban and relied on these responses for classification purposes.
9. The University of North Carolina at Chapel Hill, "Sheps Center for Health Services Research," accessed October 17, 2019. All differences in weighted population averages are statistically significant at the level of 5 percent.
10. Rural Health Information Hub, "Rural data explorer." US Census ACS, 2011 and 2017 five-year estimates. No statistical tests were run to compare rural and nonrural measures.
11. UNC, "Sheps Center for Health Services Research." All differences in weighted population averages are statistically significant at the level of 5 percent.
12. Rural Health Information Hub, "Rural data explorer." CDC Diabetes County Data Indicators, 2006–2016. No statistical tests were run to compare rural and nonrural measures.
13. Ibid.
14. Rural Health Snapshot, North Carolina Health Research Program. All differences in weighted population averages are statistically significant at the level of 5 percent.
15. Sarah Purdy et al., "Ambulatory care sensitive conditions: Terminology and disease coding need to be more specific to aid policy makers and clinicians," *Public Health* 123, no. 2 (2009): pp. 169–73.
16. Pew Research Center, "Mobile fact sheet," June 12, 2019; Melissa Majerol and William Carroll, *Medicaid and digital health: Findings from the Deloitte 2018 survey of US health care consumers*, Deloitte Insights, September 7, 2018.

17. CMS.gov, "CMS finalizes policies to bring innovative telehealth benefit to Medicare Advantage," press release, April 5, 2019; American Telemedicine Association, "Telehealth policy and reimbursement vary widely from state to state, ATA Report finds," July 19, 2019.
18. Alexis Skoufalos et al., "Rural aging in America: Proceedings of the 2017 Connectivity Summit," *Population Health Management* 20, no. S2 (2017): pp. S1–S10.
19. Rural Health Information Hub, "Telehealth models for increasing access to behavioral and mental health treatment," accessed October 17, 2019.
20. NPR, Robert Wood Johnson Foundation, and Harvard T.H. Chan School of Public Health, *Life in rural America—Part II*, May 2019.
21. Ibid.
22. Ibid.
23. National Consortium of Telehealth Resource Centers (NCTRC), "About our consortium," accessed October 17, 2019.
24. Rajendra Singh et al., "Sustainable rural telehealth innovation: A public health case study," *Health Services Research* 45, no. 4 (2010): pp. 985–1004.
25. Rural Health Information Hub, "Finger Lakes Community Health Telehealth Network," December 4, 2017.
26. U.S. Department of Veterans Affairs, "ATLAS: Offering veterans VA care closer to home," accessed October 18, 2019.
27. Joshua Ball, "Nation's first Virtual Living Room Telehealth Center brings unique care to Appalachian veterans," *Kentucky Today*, February 3, 2018; Kay Miller Temple, "The power of three: Rural schools, healthcare providers, and a rural health association collaborate to expand primary care access using school-based telehealth," Rural Health Information Hub, May 29, 2019.
28. Zoom, "Zoom for healthcare," accessed October 18, 2019.
29. eVisit, "Welcome to the eVisit resources," accessed October 18, 2019.
30. Rural Health Information Hub, "Health-e-Schools," October 9, 2019.
31. Center for Rural Health Innovation, "The Center for Rural Health Innovation," accessed November 4, 2019.
32. Center for Rural Health Innovation, "What is Health-e-Schools," accessed October 18, 2019.
33. Bonnie Darves, "Telemedicine: Changing the landscape of rural physician practice," *NEJM Career Center*, May 17, 2013.
34. National Advisory Committee On Rural Health and Human Services, "Telehealth in rural America," March 2015.
35. Michael Nochomovitz and Rahul Sharma, "Is it time for a new medical specialty? The medical virtualist," *The Journal of the American Medical Association* 319, no. 5 (2018): pp. 437–438.
36. Ken Abrams, Steve Burrill, and Natasha Elsner, *What can health systems do to encourage physicians to embrace virtual care?: Deloitte 2018 survey of US physicians*, Deloitte Insights, July 18, 2018.
37. Virtual visits are used in several departments at Carle, but one of the most widely used departments is Nutrition Services. Carle, "Patients can access virtual doctor's visits for themselves, their kids," September 21, 2015.
38. NPR, Robert Wood Johnson Foundation, and Harvard T.H. Chan School of Public Health, *Life in rural America—Part II*.



39. Neil Versel, "TytoCare gets FDA clearance for digital telemedicine stethoscope," MedCity News, November 1, 2016.
40. Felix Matthews and Chris Shudes, "Three ways health care organizations can help boomers plug into virtual health," Deloitte's Life Sciences and Health Care blog, August 15, 2019.
41. Leslie Read, "Health plans: what matters most to the health care consumer?" Deloitte, 2016.
42. Federal Communications Commission, "Rural Health Care Program," accessed November 4, 2019.
43. U.S. Department of Agriculture, "ReConnect Loan and Grant Program," accessed October 18, 2019.
44. Jon Porter, "Amazon will launch thousands of satellites to provide internet around the world," the Verge, April 4, 2019.
45. MuniNetworks.org, "Community Network Map," accessed October 18, 2019.
46. Rural Health Information Hub, "Applying for grants to support rural health projects," March 7, 2019.
47. Shantanu Agrawal and Brock Slabach, "The drive to quality and access in rural health," *Health Affairs*, (2018), Bipartisan Policy Center, *Reinventing rural health care: A case study of seven upper midwest states*, January 2018; United States Government Accountability Office, *Medicare value-based payment models: Participation challenges and available assistance for small and rural practices*, December 2016; Jacqueline LaPointe, "Flexibility, value-based payment key to rural hospital success," RevCycleIntelligence, January 26, 2018.
48. Rich Daly, "Policy changes needed to sustain CAHs: Report," Healthcare Financial Management Association, January 17, 2018.

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