



Telehealth Resources for Rural Patients Served in Federally Qualified Health Centers

Published September 2020

This resource provides an overview of the challenges of providing telehealth services in rural communities and proposes short- and long-term solutions to improve the provision of telehealth.

RURAL COMMUNITIES AND HEALTHCARE

Individuals living in rural U.S. communities, who account for fifteen percent of the population, face unique and significant challenges to health and wellbeing. Compared to individuals living in other areas, on average, individuals in rural populations have a higher average age, have higher rates of poverty, are more likely to have disabilities, and are less likely to be employed.^{1,2} Impacted by these and other factors, individuals in rural areas tend to have poorer health outcomes than the non-rural population, experiencing a higher risk of death due to heart disease, cancer, stroke, chronic respiratory disease, and unintentional injury.¹

While accessing quality healthcare is of utmost importance for rural populations, rural areas encounter barriers to care including consistent provider shortages, hospital closures, and lack of proximity to local providers.² Access to primary and behavioral health providers are especially inadequate. Estimates from the National Ambulatory Medical Care Survey in 2012, found that the supply of primary care physicians in nonmetropolitan areas was 39.8 per 100,000 population, as opposed to 53.4 per 100,000 in large metropolitan areas.³ Similarly, a snapshot of the rural population by the National Rural Health Association found that for every 100,000 rural patients, there were 30 specialists, compared to 260 per 100,000 urban patients.⁴

Federally Qualified Health Centers are a primary provider of health care to rural populations. According to the Health Resources and Services Administration (HRSA) Bureau of Primary Health Care, in 2019, approximately one in five rural residents were served by health centers.⁵

CHALLENGES WITH TELEHEALTH PROVISION IN RURAL AREAS

The Digital Divide

With the challenges of provider shortages and lack of accessible facilities, telehealth presents an opportunity for health centers serving rural area to expand health services, integrate primary care with subspecialty services, and improve care management.⁶ Telehealth provision in rural communities is particularly important and in demand during the COVID-19 pandemic as many health centers have had to quickly transition to providing remote services. While telehealth has the potential to improve healthcare provision and access, many rural areas lack the reliable broadband connection and devices necessary for high quality telehealth provision.

A significant portion of rural households do not have access to the current standard for broadband (25Mbps) necessary for high quality video communication and downloads.⁷ In the 2020 Broadband Deployment Report, the Federal Communications Commission (FCC) found that while there have been improvements in broadband connection over the years, 22.3% of individuals living in rural America and 27.7% of individuals living in Tribal lands still lack terrestrial 25/3 Mbps broadband, compared to only 1.5% of the urban population.⁸ This is especially concerning as research has shown a lack of broadband internet access to be associated with lower rates of telehealth visits.⁹

Mobile Long-Term Evolution (LTE) is also limited in rural areas. LTE is a standard for wireless data transmission for mobile devices and data terminals. While there have been improvements in deployment of mobile LTE over the years, disparities between rural and urban areas persist. While 83.3% of rural households had mobile LTE (coverage at median speeds of 10/3 Mbps) in 2018, almost all of urban Americans (97.1%) had access.⁸

Device ownership, often essential to provide telehealth services and for remote patient monitoring, is also relatively low among rural, compared to non-rural, populations. In 2019, for example, 71% of adults based in rural areas had smartphones compared to 83% for both urban and suburban areas.^{10, 11} In the same year, while 80% of suburban households had a desktop and/or laptop, only 69% of rural households did. Individuals in rural U.S. communities are also less likely to have multiple devices compared to individuals living in suburban areas.¹² It is important to point out that lack of device ownership is especially a challenge for rural residents with low income. Nationally, 29% of adults with low income do not own a [smartphone](#).¹³ Fifty-seven percent (57%) of children in households with incomes of less than \$15,000 had computer access, while 91% of children with households of \$75,000 had computer access.¹⁴

SHORT-TERM SOLUTIONS TO ADDRESS THE DIGITAL DIVIDE IMPACTING TELEHEALTH ACCESS IN RURAL AREAS

When physicians connect with patients both verbally and nonverbally, they are more likely to build a trusting relationship that results in quality patient care and high patient satisfaction. Video conferencing (live audio/video) is the preferred method for telehealth as it allows for both these types of communication and is associated with better outcomes.^{15,16} However, for patients who are unable to use video conferencing or have limited access, health centers may consider some of the telehealth options below.¹⁶ It is important to note that when possible, health centers should use a combination of these services. In addition, before scheduling a telehealth session with a patient, health centers should call patients to anticipate possible technological barriers and make any necessary adjustments. The following section is broken down by type of telehealth service.

Real-Time/Synchronous Communication^a



Use Less Data-Intensive Telehealth Options when Appropriate: For rural patients with functional yet limited broadband, one recommendation is for health center providers to carefully determine which services require video conferencing and which ones can be done through other less broadband-intensive telehealth services such as audio-only calls, texting, and remote monitoring. For telehealth sessions that do require video, patients with limited broadband can be encouraged to plan ahead to improve broadband connection. Some strategies to maximize available bandwidth are to turn off the connection on unused devices, move as close as possible to the wireless router, or, if using a computer, plug directly into the router with an Ethernet cable. Many health centers have shared that they find it helpful to connect by phone for the audio portion, and then connect via video separately. This can be done by calling the patient on the phone and then connecting via video through the telehealth platform, and either muting or not connecting the audio on the telehealth platform. Another option is to utilize telehealth platforms that allow audio to continue even if video is unstable. Zoom and other options allow provider and patient to call in and connect to video, but the video can be turned off and the audio will continue to function.

a Synchronous telehealth delivery is the type of communication that happens in real-time where a patient and provider can exchange information via a live discussion.



Expand Personal Access to Devices with Data/Internet: For rural residents with low income who lack devices needed to access telehealth (e.g., smartphone, tablet, and/ or computer), one recommendation is making use of programs that address affordability of devices with data. For many rural residents this may require two steps— personal access to a device and then ongoing service for that device. Health centers and their communities can work with service providers or retailers in the area on group purchasing discounts and may be able offset additional cost through fundraising or community support. Some health centers and communities have worked with companies like T-Mobile and Walmart on these initiatives. Another option is to create or support a device donation program, where community members can donate working devices which can then be cleared and provided to patients in need. When determining how to disseminate devices, some organizations have offered ‘digital prescriptions’ or ‘connectivity packages’ where providers can ‘prescribe’ devices sometimes with a set amount of prepaid minutes and/ or data. These digital prescriptions may be loans, where the patient is expected to bring it back, or not. A digital prescription may also be specifically for minutes or data, such as a ‘Minutes Rx program’. Increasing availability of devices and service often needs to be combined with programs that decrease the cost of ongoing broadband or wireless service for that device, such as the FCC’s [Lifeline](#). Available to eligible low-income consumers in every state, commonwealth, territory, and on Tribal lands, Lifeline provides a monthly discount on any one of the following services: wireless services (e.g., cell service), wireline, broadband internet, or broadband voice bundle (e.g., broadband internet with voice service). To apply for Lifeline in all states/ territories other than CA, OR, and TX, patients can use the [National Verifier application system](#). Health centers may consider these options for patients who do not have the financial nor the technology resources to access telehealth services.



Utilize Audio-Only Conferencing: For patients with very little access to high quality internet, providing a live, audio-only option for synchronous communications is a key alternative. Although audio-only telehealth does not allow for the nonverbal cues necessary for ideal provider and patient relationships, it does offer important verbal connections for building and establishing patient-provider trust. Audio-only options are also relatively easy to use for both the patient and healthcare provider and require little to no startup costs. Patients who do not have access to smartphones may use a landline option. Using free software such as [Doximity](#), an online network service for medical providers, will allow the health center caller’s name and office number to show on the patient’s caller ID.

- See this [guide on conducting virtual telephone visits](#) from the Riverside County Health System.



Access Broadband through Public Wi-Fi: Patients with limited access to broadband at home can often access the internet through local libraries or schools. Libraries in rural areas are critical sources for internet access. During the public health emergency, many libraries are finding creative solutions to keep residents connected such as providing Wi-Fi all day, offering drive-in Wi-Fi spots, reserving hot spots, and even using library vehicles to transport hotspots to neighborhoods with limited broadband access.^{17,18} In addition, some rural libraries are exploring using new technology, like TV white space, or unused television channels, to expand broadband access.¹⁹ Health centers should consider partnering with local libraries and schools which often have some of the strongest

broadband in communities, to provide access to broadband internet. If patients are utilizing public Wi-Fi for telehealth, there are privacy and security considerations that health centers should take into consideration. For example, patients should be referred to resources on how to use a secure browser connection and Virtual Private Network (VPN), verify that antivirus and security updates on personal devices are up to date, make passwords strong, and install or update firewalls.¹⁹

- Review [ONC's resources](#) on protecting and securing health information on personal devices.
- Focus: PHI has [a helpful tip sheet](#) for keeping telehealth visits private, including when using public networks.

Store-and-Forward/Asynchronous Communications^b



Review Patient Progress Outside of Live Interaction: Health centers providers can request digital images and recorded videos from patients to understand, diagnose, and monitor any condition outside of a live interaction.²¹ Information between providers and patients can be shared via email, smartphone apps, or other secure forms of messaging. While asynchronous communication requires less internet power than live video streaming, it is important to consider that large image or video files may be difficult to send with limited broadband.



Implement E-Consults to Expand Patient Access to Specialists: Providers also use telehealth to connect for mentoring, and resource sharing. E-consults, a form of telehealth communication between primary care providers and specialists, offer rural health centers an opportunity to expand care and coordination to rural patients. Using an asynchronous telehealth platform such as an online portal, primary care providers are able to contact specialists about a patient's case, attaching any relevant data.²² Specialists receive an alert about the e-consult, review a patient's case, and respond with suggestions for next steps.²³ After reviewing the case, the specialist either makes a recommendation to the provider for further care or makes an appointment for an in-person visit. This solution reduces the burden on rural patients to travel, potentially wait months to see a specialist if there is not a need, and supports rural providers in decision making.

- Read about the [experience of health centers in California implementing eConsults with RubiconMD](#).
- Using [ConferMED](#), a secure platform that facilitates clinical consultations between a primary care providers and specialists, Penobscot Community Health Care (PCHC) in Maine provides [dermatology eConsults](#) to increase the early detection of skin cancers.

^b Store-and-forward communication involves patients and physicians communicating on their own time via re-viewing medical history, images and reports.²⁰

Remote Patient Monitoring (RPM)



Utilize Devices to Monitor Patient Health: To monitor patient progress, especially for patients who are chronically ill, health centers can use remote patient monitoring (RPM), an electronic method of collecting self-reported or biometric patient health data via a device.^{24,25} RPM devices take a wide range of wearable forms (e.g., weight scales, sensors, user interfaces, software, and algorithms) and are able to measure a patient's physiological indicators such as blood pressure and heart rate.²⁴ Early studies show that RPM programs are cost effective. A Veterans Health Administration program using RPM, for example, spent \$1,600 per patient using RPM as opposed to \$13,000 per patient for traditional care.²⁵ If funding for devices is an issue, health centers can explore placing monitors, such as blood pressure cuffs, at community locations like local libraries. Alternately, for patients who are unable to get access to devices for lack of insurance coverage or shortage, health centers can have their Community Health Worker or Outreach staff visit patients to monitor progress, if that is an option.

- Access the [Mid-Atlantic Telehealth Resource Center's Remote Patient Monitoring \(RPM\) Toolkit](#) which walks users through implementation of a remote patient monitoring program.
- During the COVID-19 pandemic, RPM is even more relevant. It is an especially useful tool when serving rural areas with older populations to allow seniors to receive care at home. Review the [COVID-19 Telehealth Guide: Virtual Check-ins, VCS, e-Visits & RPM](#) from Certintell Telehealth.

Mobile Health (mHealth and telehealth using data-enabled mobile devices)



Engage Patients Using SMS Texting: For patients with access to a mobile device with cell service, health centers can include a texting or messaging option in their telehealth services for patient engagement. SMS texting or messaging can be used for a multitude of healthcare services including behavioral health care, chronic disease management, medication adherence, and patient follow up. In chronic disease management, studies have shown clinical improvements with the use of SMS texting. For example, a mixed-method study that explored the implementation of a diabetes text program among Latino patients served at health centers found that the text messaging program contributed to clinically meaningful improvements.²⁶

Building Capacity of Rural Primary Care Physicians through Training

Telehealth, in addition to clinical services, includes remote non-clinical services (e.g., clinician training, continuing education, and specialist consultation), which are less accessible to rural providers. The following are strategies for health centers to improve specialty care in rural communities using telehealth technology.



Use Project ECHO to Acquire New Skills: [Project ECHO](#) uses telehealth, typically video conferencing, to link specialty care and primary care in underserved areas by building the knowledge and expertise of front-line clinicians through a learning community. Rural primary doctors participate in frequent telehealth sessions where they receive case-based learning, mentoring, and support with developing patient treatment plans from specialist teams.⁴ A recent systematic review of Project ECHO found that overall ECHO participants had higher levels of satisfaction, increased knowledge, and clinical confidence. The review found improvements for patient-related outcomes in hepatitis C, chronic pain, dementia, and type 2 diabetes.²⁷



Find resources on the Rural Health Information Hub: The [Rural Health Toolkit](#) provides many resources on telehealth models for increasing access to specialty care. For example, [Medical Advocacy & Outreach's](#) telehealth services provide HIV/AIDS care to patients in rural parts of Alabama through specialty consultation and referral to services.

LONG-TERM SOLUTIONS TO ADDRESS THE DIGITAL DIVIDE IN RURAL AREAS

Although short-term solutions are important to address immediate challenges, long-term strategies should be implemented to focus on expanding telehealth in rural areas. The HRSA/Federal Office of Rural Health Policy (FORHP) [Office for the Advancement of Telehealth \(OAT\)'s telehealth programs](#) provide funds to promote and improve telehealth services. Additionally, improving broadband in rural areas is an important investment. Below are several funding options available to improve broadband in rural areas. While some of these funding opportunities are meant for health centers to apply for directly, others require health centers to work with partners to be most competitive.

Improve Broadband and Telephone Infrastructure by Applying for Funding

The following are examples of funding opportunities; there may be other local, state, or federal funding opportunities to consider. Funding opportunities often change over time, so be sure to review current information to determine availability and relevance.

- A. [USDA Rural Broadband Access Loan and Loan Guarantee Program](#) - provides loans for startup costs needed to provide broadband in rural areas. Applicants may be non-profit or for-profit organizations and must be one of the following: a corporation, limited liability company, a state or local unit of government, Indian tribe or tribal organization.
- B. [USDA Distance Learning and Telemedicine Grants](#) - provides financial assistance to improve telemedicine services and distant learning in rural areas. The funds can be used for equipment, broadband transmission facilities, technical assistance for equipment, and others. Applicants be an incorporated organization, an Indian tribe or tribal organization, a state or local unit of government, a consortium, or other legal entity, including a private corporation.
- C. [Federal Communications Commission Rural Digital Opportunity Fund](#) – will offer up to \$20.4 billion over the next ten years to improve broadband speed in rural areas, representing the FCC's largest investment to close the digital divide. The first phase of the auction covered more than six million homes under census blocks with less than 25/3 Mbps. Phase one of the auction closed on July 15, 2020. The second phase will cover additional areas. Applicants must prove that they are financially and technologically capable.
- D. [USAC Rural Health Care Program- Rural Healthcare Connect Fund](#) - provides a flat discounted rate for eligible expenses that relate to broadband connectivity. Rural public or nonprofit healthcare providers are eligible to apply.
- E. [USAC Rural Health Care Program Telecommunications \(Telecom\) Program](#) - provides reductions in telecommunications and voice services for rural health providers. To qualify, applicants must be a non-profit or public entity and located in a rural area, and be a certain type of healthcare provider (rural health clinics are eligible).

- F. [Microsoft Airband Initiative](#) - This initiative is a strategic approach that brings together private and public-sector organizations to help address the need for better broadband access in rural America. Microsoft outlined a comprehensive US rural broadband strategy to help connect at least 25 million Americans without access to broadband, of which over 19 million live in rural communities. For additional information, refer to the 2018 report, [“An Update on Connecting Rural America”](#).

Build Partnerships with Private Payers, State Medicaid, and Local Partners

In addition to applying for funding, it is critical for health centers to build partnerships. Rural healthcare providers should look into partnering with Medicaid officials and private insurance representatives for long-term sustainability. Partnering with payers can lead to funding for pilot programs and a shared understanding and commitment to finding solutions for high-cost issues. Partnering with other healthcare providers can increase knowledge about methods to improve broadband connectivity in the area. Finally, health centers should consider partnering with local partners, such as libraries and schools, to improve access to broadband in rural communities. Partnerships with local partners can focus on advocacy, referrals, or creating and implementing plans to help low-income and poor residents to better access high quality internet.

- For example, creating partnerships with other health centers has shown efficacy through the [North Country Telehealth Partnership of New York state](#), which has numerous active telehealth and telemedicine projects. This partnership works to help collaborate and sustain telehealth projects in rural areas. In underserved areas of New York, provider and funding shortages can be a great barrier to telehealth projects, so networks are an important resource for extending clinical capacity and improving services.

CONSIDERATIONS FOR PROVIDING TELEHEALTH IN RURAL COMMUNITIES



Make Telehealth Visits Regularly Available: Provider and patient relationships are critical components for improving patient health outcomes. When in-person interactions are not possible, it is important for telehealth visits to be made regularly available to patients with frequent communication. This means that telehealth visits need to be made available in the provider schedule, and outreach may need to be done to be sure that all patients who need care know that telehealth visits are available and receive assistance in preparing for telehealth visits. In addition, health center providers should use a combination of telehealth options available when treating patients.

A Note about Telehealth Reimbursement Status:

During the COVID-19 pandemic, CMS is waiving billing restrictions allowing patients to receive a wider range of services and the types of clinical practitioners that could bill for Medicare telehealth services. Included in these changes, is the option for providers to use audio-only telephone services, waiving the video requirement. However, it is not clear whether these changes will be long term or only during the pandemic. In addition, CMS is allowing FQHCs to bill for telehealth services beyond just as an originating site.²⁸ Although these waivers were specifically for Medicare recipients, as Medicaid is jointly run by the state and federal government, Medicaid state programs have flexibility in creating their own telehealth policies.²⁹ Telehealth reimbursement policy during the public health emergency is developing. For the most recent telehealth information, please refer to CMS and [state-specific guidance](#).



Privacy and Security: While many people see the benefits of mobile health, studies show that there are consistent concerns about the protection of personal information.³⁰ These concerns include security of private health information when connecting remotely. The security of wireless internet (WiFi), particularly if using public or shared WiFi, is an important consideration, and the security of mobile health, including text messaging or mobile applications. This is especially concerning as a study in 2013, showed that 41% of healthcare smartphone users did not protect their smartphones. Below are resources that health centers can use to address privacy considerations.

- [HITEQ's Privacy and Security Resources](#). In particular, to assist health centers in establishing mechanisms to protect patient privacy while texting, refer to the [Cybersecurity Checklist for Health Center Staff](#).
- The Health Center CIO's [Guide HIPAA Compliant Text Messaging](#), a slide deck that provides information on HIPAA and text messaging risks and important information for leadership to consider when providing text options.
- [User Authentication in Smartphones for Telehealth](#), an article that lists various security methods for confirming patient identity.

HITEQ is a national Training and Technical Assistance Center operated by John Snow Inc. and Westat. This publication is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling \$768,000 with 0 percentage financed withnongovernmental sources. The contents are those of the author and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS, or the U.S. Government.



REFERENCES

1. Centers for Disease Control and Prevention (2017). About rural health. Retrieved from: <https://www.cdc.gov/ruralhealth/about.html>
2. Kaiser Family Foundation (2017). The role of Medicaid in rural America. Retrieved from: <https://www.kff.org/medicaid/issue-brief/the-role-of-medicaid-in-rural-america/>
3. Hing, E., & Hsiao, C. J. (2014). State variability in supply of office-based primary care providers: United States, 2012. NCHS data brief. Retrieved from: https://www.ruralhealthweb.org/NRHA/media/Emerge_NRHA/PDFs/db151.pdf
4. Rural Health Information Hub (2017). Project ECHO – Extension for community healthcare outcomes. Retrieved from: <https://www.ruralhealthinfo.org/project-examples/733>
5. Improvement, D. Q. (2019). HRSA Health Center Program. Health Center Program. Retrieved from: <https://bphc.hrsa.gov/sites/default/files/bphc/about/healthcenterfactsheet.pdf>
6. Nagata, J. M. (2020). Rapid scale-up of telehealth during the COVID-19 pandemic and implications for subspecialty care in rural areas. *Journal of Rural Health*, 40(3), 1612840.
7. Mathew, T. (2017). Broadband is largely inaccessible to those who need it most. Retrieved from: <https://www.citylab.com/equity/2017/09/broadband-is-the-most-inaccessible-to-those-who-need-it-most/539880/>

8. [Federal Communications Commission \(2020\). 2020 broadband deployment report. Retrieved from: https://docs.fcc.gov/public/attachments/FCC-20-50A1.pdf](https://docs.fcc.gov/public/attachments/FCC-20-50A1.pdf)
9. Wilcock, A. D., Rose, S., Busch, A. B., Huskamp, H. A., Uscher-Pines, L., Landon, B., & Mehrotra, A. (2019). Association between broadband internet availability and telemedicine use. *JAMA Internal Medicine*, 179(11), 1580-1582. Retrieved from: <https://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2739054>
10. Pew Research Center (2020). Mobile Fact Sheet. Retrieved from: <https://www.pewresearch.org/internet/fact-sheet/mobile/>
11. NORC Walsh Center for Rural Health Analysis (2019). Rural Transportation Toolkit [online]. Retrieved from: <https://www.ruralhealthinfo.org/toolkits/telehealth/1/barriers>
12. Perrin, A. (2019). Digital gap between rural and nonrural America persists. Retrieved from: <https://www.pewresearch.org/fact-tank/2019/05/31/digital-gap-between-rural-and-nonrural-america-persists/>
13. Anderson, M. & Kumar, M. (2019). Digital divide persists even as lower-income Americans make gains in tech adoption. Retrieved from: <https://www.pewresearch.org/fact-tank/2019/05/07/digital-divide-persists-even-as-lower-income-americans-make-gains-in-tech-adoption/>
14. Child Trends. (2018). Home computer access and internet use. Retrieved from: <https://www.childtrends.org/indicators/home-computer-access>
15. Toh, N., Pawlovich, J., & Grzybowski, S. (2016). Telehealth and patient-doctor relationships in rural and remote communities. *Canadian family physician Medecin de famille canadien*, 62(12), 961–963. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5154642/>
16. Mechanic OJ, Persaud Y, Kimball AB (2020). Telehealth systems. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK459384/>
17. Staley, T. (2020). Rural libraries face dramatic choices as some states begin to reopen. Retrieved from: <https://dailyyonder.com/rural-libraries-face-dramatic-choices-as-some-states-begin-to-reopen/2020/05/19/>
18. LaPierre, S. (2020). Digital access during Covid-19. Retrieved from: <http://publiclibrariesonline.org/2020/05/digital-access-during-covid-19/>
19. Office of the National Coordinator for Health Information Technology (2019). How Can You Protect and Secure Health Information When Using a Mobile Device? Retrieved from: <https://www.healthit.gov/topic/privacy-security-and-hipaa/how-can-you-protect-and-secure-health-information-when-using-mobile-device>
20. Center for Connected Health Policy. (n.d.). About Telehealth. Retrieved from: <https://www.cchpca.org/about/about-telehealth/store-and-forward-asynchronous>
21. Barriers, D., & Access, I. (2017). Telemedicine: Decreasing barriers and increasing access to healthcare. Retrieved from: <https://www.healthcarevaluehub.org/advocate-resources/publications/telemedicine-decreasing-barriers-and-increasing-access-healthcare>
22. Wicklund, E. (2020). How eConsults can offer a virtual care connection to specialists. Retrieved from: <https://mhealthintelligence.com/features/how-econsults-can-offer-a-virtual-care-connection-to-specialists>
23. Bi-State Primary Care Association (2020). H. 723, eConsults, and federally-qualified health centers. Retrieved from: https://bistatepca.org/uploads/pdf/Public%20Comments/2020/eConsult_Testimony_02052020.pdf
24. Goodridge, D., & Marciniuk, D. (2016). Rural and remote care: Overcoming the challenges of distance. *Chronic respiratory disease*, 13(2), 192–203. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5734598/>
25. Landi, H. (2020). FCC's Carr: \$100M health pilot to benefit low-income patients, veterans. Retrieved from: <https://www.fiercehealthcare.com/tech/fcc-s-carr-says-100m-connected-care-pilot-will-benefit-low-income-patients-veterans>

-
26. Watterson, J. L., Rodriguez, H. P., Shortell, S. M., & Aguilera, A. (2018). Improved diabetes care management through a text-message intervention for low-income patients: Mixed-methods pilot study. *JMIR diabetes*, 3(4), e15. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6238849/>
 27. McBain, R. K., Sousa, J. L., Rose, A. J., Baxi, S. M., Faherty, L. J., Taplin, C., Chappel, A., & Fischer, S. H. (2019). Impact of project ECHO models of medical tele-education: A systematic review. *Journal of general internal medicine*, 34(12), 2842–2857. Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/31485970/>
 28. Centers for Medicare and Medicaid Services (2020). Trump administration issues second round of sweeping changes to support U.S. healthcare system during COVID-19 pandemic. Retrieved from: <https://www.cms.gov/newsroom/press-releases/trump-administration-issues-second-round-sweeping-changes-support-us-healthcare-system-during-covid>
 29. NACHC (2018). Telehealth and health centers. Retrieved from: <http://www.nachc.org/wp-content/uploads/2019/03/Telehealth-Fact-Sheet-1.3.19.pdf>
 30. Smith, K. A., Zhou, L., & Watzlaf, V. (2017). User authentication in smartphones for telehealth. *International journal of telerehabilitation*, 9(2), 3–12. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5716614/>
 31. Cisco (2013). BYOD Insights 2013: A Cisco partner network study. Retrieved from: https://iapp.org/media/pdf/knowledge_center/Cisco_BYOD_Insights_2013.pdf