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Testimony to The Committee on Small Business, "Closing the Digital Divide: Connecting Rural Americans to Reliable Internet Service."

My name is Clifford Belden, and I am a physician and the Chief Medical Officer at Columbia Memorial Hospital, located in Hudson, NY. My testimony today will be focused on the impact that broadband internet access, or the lack thereof, has on the delivery of healthcare in rural areas.

There are 3 broad areas where the impact of broadband is felt in the delivery of health care – it impacts the patient, the location and types of services available in a facility and has a sometimes-unrecognized effect on our workforce.

First, the patient. The patient is the center of why organizations like Columbia Memorial Hospital exist in rural counties. Twenty five percent of the population of the United States lives in rural counties, yet only 10% of physicians live in the same rural counties, creating a significant mismatch between the need and availability of physicians. The mismatch is even greater in subspecialties, particularly for those in which there is a nationwide shortage, such as obstetrics, dermatology and child psychiatry.

Telemedicine has been championed to improve care and help bring the input and expertise of specialists to rural communities and their patients. Telemedicine has many different forms, including:

- Face-to-face teleconferencing between the patient and a provider at their home or a medical facility
- Consultation between physicians or other health care providers, either in real-time or asynchronously
- Remote monitoring of patients with certain medical conditions
- Tele rehabilitation for patients at home
- Education of patients at their home

A recent study (*JAMA Intern Med.* Published online July 29, 2019 doi:10.1001/jamainternmed. 2019.2234) looked at the use of telemedicine visits in rural counties and found over 50% more use of telemedicine visits when the rural county had high wired broadband availability. When broadband has a high penetrance in a community, its citizens learn to use and trust the technology, which leads to acceptance and adoption of these new tools and technologies. In communities with low broadband penetrance, there are fewer potential users of the technology, and those end-users are slower to adopt the technology, resulting in a challenge for health care organizations to make large investments in developing patient facing programs centered around telemedicine.

Remote monitoring of patients with medical conditions such as congestive heart failure (CHF) and chronic respiratory illnesses (such as COPD and emphysema) can have a dramatic impact for a patient. For patients with CHF, remote telemonitoring decreased hospital admissions and readmissions, mortality, and improves overall quality of life. Similarly, treatment costs, readmissions and admissions are lower for patients with COPD when remote monitoring devices are employed. At Columbia Memorial Hospital, we have begun to use remote telemonitoring for some of our patients. Without broadband access, however, the monitoring equipment requires a dedicated cell phone to send the information to the remote monitoring systems. To offer the service, we provide a cell phone with a data plan to each patient that is remotely monitored, which makes the widescale spread of remote telemonitoring significantly more expensive than if it simply used an existing broadband wireless network, and impossible in areas that also lack cell phone signal.

Second, the location of medical facilities and types of services available in those facilities are dictated by the availability of broadband. Reliable broadband internet access is critical to the provision of medical services in 2019. Our organization has one office remaining that does not have reliable commercial broadband access, and simple tasks such as viewing an x-ray are challenging, and two do not have dedicated point-to-point connections, necessitating the use of a virtual private network (VPN), which is less efficient. Two of our outlying facilities rely on broadband using nearby microwave towers. Placement of an orthopedic office, urgent care center or facility that provides x-ray or ultrasound services is nearly impossible in a location that does not have commercial grade broadband access.

Ideally, broadband networks are redundant to ensure near 100% uptime for healthcare facilities. In areas with poor broadband penetration , redundancy is lacking. Typically, there is a single fiber backbone even if there is more than one broadband provider, which can lead to more frequent outages.

Finally, access to broadband at home is a requirement for many healthcare workers. Medical specialists, such as orthopedic surgeons, neurologists, neurosurgeons, radiologists, pulmonologists and urologists, need to review medical charts and images in a timely manner at all hours of the night. Columbia Memorial Hospital's stroke program has had the American Heart Association Stroke Gold Plus designation for the past 2 years, a program that is supported using tele neurology services from our local neurology group and teleradiology services from both a local and national group. A neurologist or radiologist that provides these services cannot buy a home in an area that does not have broadband. I am a radiologist, and the first question I asked when looking for a farm in rural upstate NY was what the internet connectivity status was. On my road, broadband cable access stopped at my house. Sixteen years later, cable still hasn't made it down the road to my neighbors.

Increasingly, it is not just specialists that need reliable broadband connectivity. It is not unusual for a primary care physician to spend 2 hours in the evening completing documentation, reviewing notes and answering questions that patients may have. Transcriptionists commonly work off-hours remotely and require broadband access. The lack of reliable high-speed internet access impacts where health care professionals can live in very tangible ways, creating regions that benefit from added potential homeowners and those that do not.

In summary, reliable internet access is a requirement for the efficient delivery of health care in the rural environment. The lack of broadband access has a negative impact on patients, their communities and the people who provide care.