Technology Innovation Supporting Access to Rural Health and Human Services: Possibilities and Encouraging Further Investments

Final Committee Report
October 2024

Introduction

Innovation and technology are rapidly changing the way health and human services are delivered. It is unclear how rural communities will fare as these technologies diffuse and there is concern that existing disparities may worsen if rural issues are not at the forefront of attention as investment and policy decisions are made. The National Advisory Committee on Rural Health & Human Services (NACRHHS) recognized the need to convene stakeholders and experts on this topic to better understand the rural context in this vital area. In early 2024, the NACRHHS engaged the Rural Policy Research Institute (RUPRI)[1] to create a policy document that would examine the role technology can play in supporting access to rural health and human services. In addition to a literature review and interviews with experts in rural health administration and use of technology in health and human services, RUPRI staff attended the Committee's meeting in April 2024 in Austin, Texas, to moderate the portion of the agenda that focused on technology and innovation in rural health.

Throughout the meeting, the Committee heard from subject matter experts, Committee members, and key stakeholders on rural challenges and how technology is currently assisting with those challenges and how innovation and technology might play a role in the future. This report presents the background and impetus for the meeting and summarizes key themes along with policy considerations meant to spur innovation and allow technological solutions to improve health and human services for rural residents. The Committee may share content of this document in correspondence to the Secretary of the Department of Health and Human Services.

Background and Purpose

Strategies and actions to improve access to essential services for rural and tribal residents should include focusing technological innovation on meeting unique rural challenges. Innovative ways of using the power of information technology (including artificial intelligence, (AI) will help achieve the quadruple aims of better patient and participant experience, better community health, lower costs, and

[1] RUPRI, based in the College of Public Health, University of Iowa, has a diverse portfolio of policy analysis across policy sectors, including housing, governance, and economic development. Most of its activity is within health, through its Center for Rural Health Policy Analysis and RUPRI Health Panel. Its broad portfolio and 30+ years in rural health policy made it an ideal choice for this task.

greater health and human services provider satisfaction.[2] In addition, an over-arching goal of achieving equitable access to the full range of health and human services is more readily achieved across geography with strategic use of new technologies.

Advances in communication technologies will facilitate new strategies for reaching populations where they live (telehealth being the umbrella term that encompasses a wide array of activities). New technologies that support clinicians and service providers are changing where and how services are delivered. While much of the "action" in adopting new technologies in health care is focused on decisions made by large health systems, the area of greatest potential for patients (including community residents not actively receiving clinical services) and service providers should be in rural places facing significant challenges to meet objectives derived from the four aims. This illustrates a troubling paradox with respect to the forces of innovation and technology and rural health and human services: the people and communities that would benefit the most from leveraging data and technology to improve access are in the least favorable position in terms of having the tools and infrastructure to take advantage of these innovations.

When considering public policy activities that would encourage innovators in technology to focus on meeting challenges in rural health and human services delivery requires evaluating which technology-driven changes could be effective within the rural health care and human services environment. Encouraging innovators to focus on rural and tribal areas means the exact nature of what they would propose is unknown. Even within the broad rural and tribal designation there exists a continuum of capabilities in terms of responding to technological advances. Pinpointing focus on the communities most in need is necessary, including those with the smallest populations, those who are geographically isolated, and those suffering from high poverty. Without such focus, the starkest disparities will undoubtedly get worse at least initially.

Key Question:
The question we are addressing is: What actions or resources would bring the benefits of technological innovation to meeting rural health and human services challenges? Ultimately, innovators must be matched with receptive local stakeholders, and have access to capital to fund initial development and application of new technologies.

Before turning to the key themes and takeaways from the April meeting, we summarize the critical challenges facing rural health and human services as well as the local interest in exploring new technology in meeting these challenges.

Critical Challenges
Attracting new technology to rural and tribal areas requires a market that is receptive to change, exhibiting a demand for improved value and potential for a growing client base. Local healthcare providers (including hospitals, federally qualified health centers, rural health clinics, skilled nursing facilities and home health agencies, and independent physician practices), human service providers, and

[2] The quadruple aim is a modification of the original triple aim, as developed in the health sector by the Institute for Healthcare Improvement and adopted by CMS – "patient experience" is the term used to describe the first aim, but should be interpreted to include an integrated set of health and human services.

community-based organizations expected to use new technologies will need to see doing so as meeting a critical need. In much of rural America, those stakeholders are facing two short-term related priorities, securing revenues to meet growing expenses, and maintaining an adequate workforce. An emerging priority is the need to implement protective measures for cybersecurity. Advances in artificial intelligence (AI) may be helpful to the extent they replace routing administrative functions that currently burden health and human services providers.

In many places, they are also adapting to new modalities of delivering healthcare services, including coordinating with human service and community-based organizations, and new payment models, both of which increasingly address social determinants of health (SDOH). Previous work of the NACRHHS, along with interviews of rural health facility administrators, identified specific policy priorities, including:

- Improving transportation services in rural places, particularly for high-need patients
- Participating in new collaborations with other organizations (including community-based human service organizations), driven by data analytics
- Negotiating payment rates with commercial insurance plans, including Medicare Advantage plans and Medicaid Managed Care Organizations, and maximizing revenues through improved documentation (coding, other information related to patient chronic and episodic conditions)
- Using information technology to improve care management, particularly relevant in optimizing revenue in new payment models through improved coordination across all points of service delivery that contribute to sustained optimum health and well-being
- Adopting new care modalities in ways that enhance access to, and use of local services across the continuum that includes clinical care and human services
- Providing in-home health and human services
- Implementing virtual care, including 24-hour nursing care
- Improving navigation of multiple points of entry into the continuum of health and human services, making connections to the full array of potentially beneficial services regardless of the entry point

Interests among innovators in healthcare technology

In preparation and as background for the meeting and this report, faculty from RUPRI had discussions with rural health care administrators and other professionals with vested interest in the use of technology in meeting the health care needs of rural residents (contacts through the U of Iowa alumni network, and suggestions from the National Advisory Committee on Rural Health and Human Services) to help answer three questions:

1. Who (by characteristics, and specific examples) would be attracted to rural development and application of new technologies?
2. What would motivate them to engage rural community-based providers (both independent and members of regional systems) for the purposes of meeting the leading challenges they face?
3. How would they interact with local stakeholders to implement new technologies?

Stakeholder responses to those questions (briefly summarized below) assisted the Committee in assembling the program and panel of experts and for the April meeting.

Takeaways from RUPRI Center discussions

- Workforce: nearly every conversation with respect to improving access in rural health care starts with workforce needs. As it relates to technology, innovations that can leverage existing workforce, whether providers, technicians, or staff, are seen as critical solutions to improve access to care. For example, using AI to transcribe visit content and populate record systems (e.g., the electronic health record, visit notes in human services) can free time for more direct interaction with patients/clients.
- Networks: in rural areas, rapid deployment of innovation will not occur county by county, hospital by hospital; leveraging existing alliances of hospitals and fostering more regional collaborations will encourage more technological development. Alliances could include human services organizations, particularly in meeting participants needs for housing, transportation, and food nutrition that help with managing chronic conditions and improving well-being.
- Rural interest in technology: survey evidence suggests rural residents are equally comfortable with technology-driven access and virtual care.
- Broadband: inequities in rural access will further slow the adoption of innovations; rural geography is an underappreciated barrier to quality broadband
- Licensing & education: innovative solutions may require changes in licensing requirements and scope of practice regulations in the health care workforce as well as changes in the way we train the rural healthcare workforce; opportunities for partnership with local education systems

April 2024 Meeting Themes and Proposed Policy Considerations:

Over-arching Themes:

Broadband Access

Quality access to broadband services emerges as a major factor and potential barrier to innovation in rural health and human services. RUPRI interviews with rural health care stakeholders prior to the April meeting identified broadband as a limitation in rural areas and the discussions emerging during the NACRHHS meeting further corroborated the vital requirement of quality broadband for nearly every potential avenue for innovation and technology to improve rural health outcomes.

Committee members and panel experts noted challenges both for rural health and human service organizations as well as rural residents. Given new classifications for broadband speed, up to 45 million Americans now lack availability of quality broadband services, up from 23 million previously (FCC Press Release March 14, 2024). In RUPRI conversations with rural health care administrators, broadband issues were frequently noted with respect to the use of certain telehealth services. Broadband was also a potential barrier for innovations in emergency services. Equipping emergency response vehicles with more capabilities means relying on broadband access in many cases. In rural terrain often featuring hills, mountains, and valleys, connectivity continues to be a barrier to deployment.

Committee members shared examples of residents in their communities that lacked affordable broadband access, often suffering from the "last mile problem"[3] with respect to access. Connecting homes and businesses to a network is always the costliest phase of access. In rural areas, distances, terrain, and poor existing infrastructure make this a bigger challenge. The potential divide for poor communities to obtain and use the devices that can leverage broadband access was also noted by Committee members as a concern. Innovations such as remote patient monitoring or other application-based interventions, including many digital therapies that may alert residents and providers to potential health issues in real time will suffer from inequities in rural areas as long as broadband access inequities remain. Low earth orbit (LEO) satellite internet was noted for its potential, though current costs make the service unrealistic for many rural residents. It is also important to recognize the significant forthcoming investments from the Infrastructure Investment and Jobs Act, also referred to as the Bipartisan Infrastructure Law[4]. This legislation allocates $65 billion toward broadband infrastructure across seven major program areas, aiming to both increase access and lower costs.

RUPRI Suggested Consideration for HHS Action*:* HHS Secretary should declare a state of public health emergency to address the urgent need for broadband access, allowing for the flexibility to improve infrastructure in rural areas. Changes in infrastructure must include improvements in both potential access (e.g. satellite-based high-speed connectivity) and real access (affordable and reliable)

Creating Awareness between Innovators, Investors, and Rural End-Users

During the April meeting, the Committee came to see several topics (with funding sources at the top of the list) related to technological innovation and rural health and human services where HHS can play a role as a convener in connecting important constituencies interested in improving health and human services for rural residents that currently lack a common forum.

RUPRI Suggested Consideration for HHS Action: Use the power of convening for national discussion and dialogue, supported by HHS

RUPRI Suggested Consideration for HHS Action: Encourage state and sub-state regional convening sponsored by others (philanthropic organizations and/or State Offices of Rural Health)

RUPRI Suggested Consideration for HHS Action: Create a focus for rural innovation within HHS (involving CMS/CMMI, HRSA, etc.)

Partnerships and Networks

In rural areas, rapid deployment of innovation will not occur county by county, hospital by hospital. RUPRI interviews demonstrated the importance of leveraging existing alliances of hospitals (the focal points we learned of were hospitals, but subsequent development of Clinically Integrated Networks (CINs) who negotiate value-based payment contracts has expanded the concept to include human service providers and community-based organizations important to meeting public health goals with

[3] This refers to extending broadband to the hardest-to-reach locations, that may be single users in the case of reaching people where they live.

[4] https://broadbandusa.ntia.doc.gov/resources/federal/federal-funding, https://www.whitehouse.gov/build/guidebook/

measurable activities), health and human service provider partnerships with community-based organizations, and encouraging development of regional networks to share resources and encourage diffusion of successful innovations. Networks and collaboratives offer possibilities for shared staffing, data sharing, group purchasing, and the scale necessary for value-based care. Additionally, clinically integrated networks can either be expanded to include health and human services community-based organizations that extend their reach into the community to address social determinants of health (SDOH), or they can affiliate with community-based organizations to do so.

Cyber-Security and Patient Data Security

All health care organizations face the risk of ransomware attacks; however, rural facilities may be less likely to recover from such attacks given existing financial constraints. Discussion from the Committee emphasized the importance of rural considerations in current developments, both regulatory and legislative.

HHS and other federal agencies have created interagency partnerships and partnerships with the healthcare sector and technology companies to create a set of voluntary Cybersecurity Performance Goals (CPG) with the Healthcare and Public Health (HPH) sector of the Cybersecurity & Infrastructure Security Agency (CISA). CISA is the operational lead for federal cybersecurity.[5]

As technology evolves to collect more information and collect that information more frequently and using remote or wearable technology, the importance of protecting rural patient information also increases.

Specific Topics of Emphasis / Themes:

Telehealth / e-health / virtual care

In this report, we use telehealth in the broadest sense, encompassing what we know in the traditional sense as telehealth as well as innovations in e-care and virtual care. Ensuring an equitable and reliable reimbursement environment is necessary for supporting access to a wide and growing variety of services in rural areas. A majority of stakeholders interviewed by the RUPRI identified telehealth services as an example of current technology that is improving access to health care for rural residents.

The Committee learned more specifics regarding the importance of reimbursement from Carrie Nixon of Nixon Gwilt Law. In her work with numerous health care organizations, Ms. Nixon relayed the value of making telehealth payments and engagement of alternative sites permanent. She identified specific telehealth services for which evidence of efficacy is growing: remote monitoring, chronic care management, pain management, physical therapy, and behavioral therapy. Each of these could be encouraged through payment policies. She also recommended allowing supervision via telehealth, a step taken in recent CMS rulemaking. Similar to what the Committee heard from others, Ms. Nixon reinforced the need for investment in broadband capacity to reach all rural residents. Her summary regarding general actions led to two recommendations:

[5] https://hhscyber.hhs.gov/

RUPRI Suggested Consideration for HHS Action: create a rural health innovation hub within HRSA to connect with digitized health innovations and fund demonstrations.

RUPRI Suggested Consideration for HHS Action: Charge regional telehealth resource centers with including digital health and health technology in their scope of work.

A notable initiative presented to the Committee was a virtual care model meant to increase access to specialty physician care for rural residents. Dr. Nirmal Kaur of Syncoro Health LLC shared her experience with this model from her time as an executive at Henry Ford Health in Michigan and at Syncoro Health. First by establishing connections with local rural hospitals and physicians, Henry Ford partners with the local facility and locate a virtual care center in the local hospital, offering virtual services (e.g. gastrointestinal or cardiac) using Henry Ford physicians. Critically, these were services chosen by the local hospital and physicians to extend, not compete with existing rural hospital services. The virtual center model leverages the community connections of the local hospital along with the staffing expertise of a large organization like Henry Ford. Syncoro Health is building on this virtual care model in other markets.

Rural Healthcare Workforce

The challenges that rural health care organizations face with respect to physician shortages are acute. While multiple strategies are required to meet these challenges, we focus on the potential for technological innovations to help assuage these personnel issues.

Shortages of trained personnel could be ameliorated at least in part through solutions featuring telehealth or virtual services (some previously discussed in this report). Another part of the solution, however, will stem from increasing the reach and productivity of existing personnel. One of the innovations that can play an outsized role in this area is “ambient listening”. Instead of physicians dictating or typing up notes from a patient visit, technology captures and transcribes notes for the electronic medical record, alleviating this burden for physicians. RUPRI had a discussion with one rural health care administrator who estimated that this technology, when fully implemented, would be the equivalent of four additional patient visits per day per physician. Similar technologies that reduce the non-clinical tasks for physicians are likely to carry a huge return for rural hospitals. Rapid diffusion of such technology would likely need to rely on networks or collaboratives to efficiently reach rural facilities. Even in a rural state like Iowa, more than 80% of critical access hospitals belong to one of the three main alliances of hospitals in the state, making the job of connecting innovations to all hospitals less daunting.

Rural hospitals also face a shortage of expertise in deploying diagnostic technology, sonographers, for example. The Committee learned about the possibility of using telehealth services in this capacity, allowing an assistant in the room with the patient to manage the technology with the diagnostic specialist joining virtually. Barriers to the use of these telehealth services include laws dictating who must be present in the room with the patient for specific diagnostic services. More generally, for rural healthcare organizations, ensuring personnel are working at the top of their license or level of expertise is valuable.

RUPRI Suggested Consideration for HHS Action: HHS should undertake an evaluation of existing policies that present barriers to technology innovation and recommend changes to enable use of these technologies.

Human Services

Human services organizations face challenges in collecting information from potential beneficiaries to connect them with available services. Unlike their health care counterparts, human services lack the organizing hub of an electronic health record. Human service providers also face workforce shortages that are exacerbated by long distances between participants, particularly in programs that provide home based services. Technology can generate efficiencies in the delivery of services by improving the transfer of information across the programs meeting rural resident needs. The Committee heard from expert panelist Kevin Duvall, the chief technology officer for the Administration for Children and Families within HHS on the importance of aligning systems and applications with the end-user in mind as well as the vital importance of the broadband issue for human services delivery. The work of the 18F team within the General Services Administration (GS) was also noted to the Committee in this context as a potential resource as the 18F team collaborates with other government agencies on technology related challenges. 18F is a team within the GSA dedicated to assisting other government agencies to effectively provide public services through technology. [6] Administrative burdens with reporting were discussed in previous Committee meetings, including discussion on MIECHV and Disability Services.

RUPRI Suggested Consideration for HHS Action: HHS should invest in common intake forms and require programs to use them.

RUPRI Suggested Consideration for HHS Action: As the Committee has recommended previously, explore ways to reduce the administrative burden to meet reporting requirements.

AI/Digital Infrastructure

The potential for AI technology to improve health care access and outcomes for rural residents comes in part from the use of large language models and other data-driven tools to assist providers in better understanding their patient population and more proactively addressing healthcare needs. In RUPRI conversations as well as the discussion during the April NACRHHS meeting, discussions centered on rural health care organizations that are "not there yet" with respect to these technologies.

A potential barrier in the diffusion of such technology is the digital infrastructure in many rural health care and human services organizations. Rural markets in some cases lack the system interoperability required to take advantage of the latest IT solutions. Moreover, the cost of necessary system upgrades as well as the data-driven solutions themselves are prohibitive, particularly for smaller organizations and facilities. Partnerships and regional collaboratives are likely a necessity for many rural hospitals and human service providers to take advantage of these innovations.

[6] 18F is a team of designers, software engineers, strategists, and product managers within the General Services Administration to collaborate with other agencies to fix technical problems, build products, and improve public service through technology. https://18f.gsa.gov/about/

In that vein, during conversations with the RUPRI, Intermountain Health explained that they use their leverage as a large healthcare system and their relationship with an advanced software vendor to assist smaller rural hospitals. Intermountain offers the smaller hospitals the opportunity to upgrade their digital platforms to enable the use of innovative solutions. Intermountain also shares their own digital expertise in these partnerships and in some cases shares staffing. During the April meeting, Dan Roline of Mayo Health shared the details of a similar platform that Mayo offers to its network of smaller, often rural hospitals.

Sources of Funding

Connecting innovators and technological solutions to rural health challenges with sources of capital is an area where HHS can use the power of convening. During the April meeting, the Committee heard from experts in private sources of capital, philanthropic efforts to fund innovation, as well as experts in public sources of funding, including the newly established Advanced Research Projects Agency for Health (ARPA-H).

With respect to private capital, the Committee heard from expert panelist Jeff Kerrigan, Vice President of Pharos Capital Group regarding the potential role for the middle market of private capital to fund rural innovators. The goal of this middle capital market is to identify innovators where the proof of concept for the innovation itself is in place and the goal is to build scale and provide support to move the organization past the startup phase and into a position where stable revenues can support the venture. Jeff shared examples of investments that Pharos has been involved in as part of this health venture. An example from human services was Beacon Specialized Living which coordinates care in an independent setting for individuals with disabilities and mental health needs. Beacon expanded in scale from 17 houses to over 200 houses and obtained state Medicaid contracts. On the health care side, Sanderling Renal Services provides dialysis and renal telemedicine services focused on communities with limited access to health care resources. With investment from Pharos, Sanderling expanded into the home dialysis market in Ely, Nevada.

Bon Ku, Program Manager for Resilient Systems, Advance Research Projects Agency for Health (ARPA-H), shared with the Committee the overall philosophy behind ARPA-H as well as a specific funding initiative designed to improve health care access in rural areas. ARPA-H aims to fund the moonshot initiatives that are unlikely to be undertaken through typical research or commercial activity due to the inherent high risk in such ventures. ARPA-H thus acts to "de-risk" these initiatives and ultimately move the support for successful initiatives to the private sector.

The project specific to rural health seeks to bring advanced hospital-level care to every rural county in America. The Platform Accelerating Rural Access to Distributed and InteGrated Medical Care (PARADIGM) aims to create a scalable vehicle platform that can provide advance medical services outside of a hospital setting. Though ARPA-H seeks multidisciplinary groups in their funding calls, the Committee noted the importance of local community provider engagement in such projects.

The Committee also again heard about the importance of using the power of HHS as a convener to bring together various other federal sources of potential funding for rural health and human service innovators, including the Federal Reserve, the Small Business Administration, the Rural Business

Investment Company within the USDA, among others. Philanthropic organizations are another potential source of funding in this space, pointing to the value of HHS encouraging state and/or sub-state regional organizations acting as conveners to bring innovators together with potential funding sources.

Conclusion

Innovation and technology are at the forefront of improving health care and human service program delivery. At the 94th meeting of the NACRHHS, Committee members heard from experts and shared their own experiences with how we might meet challenges in rural health and human services with technology driven solutions. The Committee outlined areas where HHS can play an important role in connecting key funding and information sources with the people and organizations that seek to find innovative, technology driven solutions to improve the well-being of rural residents.