A series from the **Alternative Funding Innovation Lab**

Alt Funding Field Guide

Building sustainable funding for digital adoption

Healthcare

By Amy R. Sheon, PhD, MPH

Connect Humanity

With support from **Mission Telecom Giving**

The **Alt Funding Field Guide** is a series of publications produced by Connect Humanity's Alternative Funding Innovation Lab. It makes the case that digital inclusion programs create economic value across multiple sectors, and sets out how those sectors can co-invest to sustain the work.

This sector guide explores how digital inclusion enables effective use of healthcare technologies, makes the economic case for health system co-investment, and identifies practical entry points for partnership between digital inclusion organizations and healthcare providers.

All chapters can be found at connecthumanity.fund/alt-funding-guide/

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Section 1. Sector overview

Digitalization has driven profound changes in the healthcare sector in recent years. From the $30 billion in federal incentives for electronic health record (EHR) adoption authorized in 2009 (Alder, 2024) to the COVID-19 pandemic accelerating use of telehealth and online portals, digital technologies increasingly shape how patients access information, manage conditions, and receive care.

As healthcare undergoes this transformation, patient access to internet connectivity, devices, and digital skills emerge as a foundational requirement for effective care delivery. The health sector generally lacks core competencies to address these prerequisites. Partnerships between healthcare systems and digital inclusion organizations therefore represent an important opportunity to improve health outcomes, reduce costs, and advance health equity.

The need for healthcare efficiencies

The U.S. healthcare system is uniquely expensive. Despite spending far more per capita than peer nations, we perform worse on many system-level quality and equity measures ("How Does the Quality of the U.S. Health System Compare to Other Countries?," n.d.; Schneider et al., 2024).

Recent policy changes are intensifying pressure on patients and providers. The expiration of federal premium tax credits at the end of 2025 increased insurance costs for many households (Abelson, 2026). At the same time, Public Law 119-21 (the One Big Beautiful Bill Act) is projected to reduce federal health spending by nearly $1 trillion over ten years, largely by limiting Medicaid eligibility (Park & Corlette, 2025). Loss of coverage leads many people to delay preventive care and primary services (Institute of Medicine, 2009; Kaiser Family Foundation, 2023), relying instead on more expensive emergency and downstream care (Sommers & Gourevitch, 2016). Rural hospitals and safety-net providers are particularly exposed to these pressures (Hulver, 2025a) (Hulver, 2025b).

While clearly not a complete solution to these systemic challenges, digital technologies offer important opportunities to improve efficiency and outcomes, as detailed in section 2.

Digital exclusion as a barrier to healthcare

Patterns of digital health use mirror broader patterns of technology adoption. Telehealth and portal use remain lower among people who are older, have lower incomes or educational attainment, or prefer a language other than English. The digital divide, in turn, is closely tied to the same structural factors that impact health outcomes. Often referred to as social drivers of health (SDOH), these include income, education, housing stability,

and other socioeconomic factors (Braveman et al., 2011). The result is a significant overlap in disparities in healthcare and digital access (Sheon & Khoong, 2024). These disparities are estimated to cost more than $300 billion per year (IHI Health Equity Metrics Advisory Group, 2025).

If digital technologies are to reduce rather than reinforce health gaps, targeted efforts are needed to ensure that people have the connectivity, devices, and digital skills required to use virtual care services. Healthcare systems and digital inclusion organizations have pursued parallel efforts to improve outcomes while reducing disparities, but these sectors often operate independently. Sustained collaboration offers significant benefits for both.

How the sector works

The U.S. healthcare system is complex and highly fragmented. Care is delivered across inpatient and outpatient settings by academic medical centers, public institutions, nonprofit hospitals, and private providers.

Insurance coverage is similarly fragmented. Medicare provides federally-funded coverage for older adults and people with disabilities. Medicaid, jointly funded by federal and state governments, covers many low-income individuals. Most working-age adults receive commercial insurance through employers, while others obtain coverage through federal and state marketplaces. Payment policies established by the Centers for Medicare and Medicaid Services (CMS) strongly influence reimbursement structures across all payers.

This complexity makes the U.S. healthcare system vulnerable to inequities but also positions it with unparalleled reach and data infrastructure to advance digital inclusion at population scale.

This chapter focuses on patient-facing technologies deployed, prescribed, or monitored within healthcare settings: portals, telehealth, remote monitoring, and electronic messaging. Gaps in digital access and skills directly undermine outcomes that health systems are hoping that their digital investments will improve. Health systems provide population-level granular data that digital inclusion providers otherwise lack, and digital inclusion providers fill a crucial service gap that is outside of health systems' core competency.

The following sections examine how digital technologies currently support healthcare delivery, how digital inclusion impacts their effectiveness, and how partnerships between healthcare systems and community organizations can help ensure digital transformation improves outcomes for patients and the system at-large.

Section 2. Digital adoption in healthcare

Why digital adoption matters

Digital technologies are now central to healthcare delivery. Patient portals, telehealth visits, remote monitoring devices, and electronic messaging increasingly shape how patients access care, communicate with providers, and manage chronic conditions.

The potential benefits of these tools can be understood through a widely-endorsed rubric, the "quintuple aim for healthcare improvement":

1. Improving population health
2. Enhancing the care experience
3. Reducing costs (Berwick et al., 2008)
4. Supporting provider well-being (Bodenheimer & Sinsky, 2014)
5. Advancing health equity (Nundy et al., 2022)

Digital tools can advance each of these goals. **Population health** refers to healthcare delivery that focuses on improving outcomes for defined groups of people by addressing shared risks and needs. For example, a health system might establish mammography services in a community center serving Spanish-language speakers after identifying low screening rates and later-stage breast cancer diagnoses in that population.

Digital inclusion efforts align closely with population health strategies because barriers to both healthcare access and digital connectivity often cluster among the same populations. This creates opportunities for coordinated solutions. For example, a health system mailing reminders to patients without portal accounts could include a referral to a nearby organization offering portal training. Patient portals can then support preventive care by notifying individuals when services are due and simplifying scheduling (Ewing et al., 2026).

Digital tools also improve the **care experience** when patients can obtain care conveniently with portals, messaging, and telehealth services. They can help direct patients to appropriate, **lower-cost** care settings while reducing missed appointments and inefficient communication. By streamlining routine interactions and technical troubleshooting, these tools can also reduce administrative burden for care teams and support provider **well-being**. Finally, when logistical barriers to care are transcended, digital health technologies can expand access to care and contribute to improved **health equity** (IHI Health Equity Metrics Advisory Group, 2025).

Ensuring that patients have the connectivity, devices, and skills needed to engage with these systems is essential to achieving the healthcare sector's goals of improving outcomes, reducing costs, and advancing equity.

How digital infrastructure supports healthcare delivery

Electronic health records (EHRs) form the backbone of modern healthcare systems, while broadband connectivity functions as the nervous system linking care delivery, billing, insurance, quality reporting, and pharmacy services. Patient portals, telehealth platforms, and remote monitoring devices all operate through this digital infrastructure, enabling care to extend beyond traditional clinical settings.

As illustrated in Figure 1, these systems capture vast amounts of data on healthcare services received, types and costs of care utilized, and health outcomes. The health sector now generates roughly 30% of the world's data (*How to Harness the Power of Health Data to Improve Patient Outcomes*, 2024). This healthcare data can offer insights on digital inclusion returns on investment at a larger scale and lower marginal cost than other sectors.

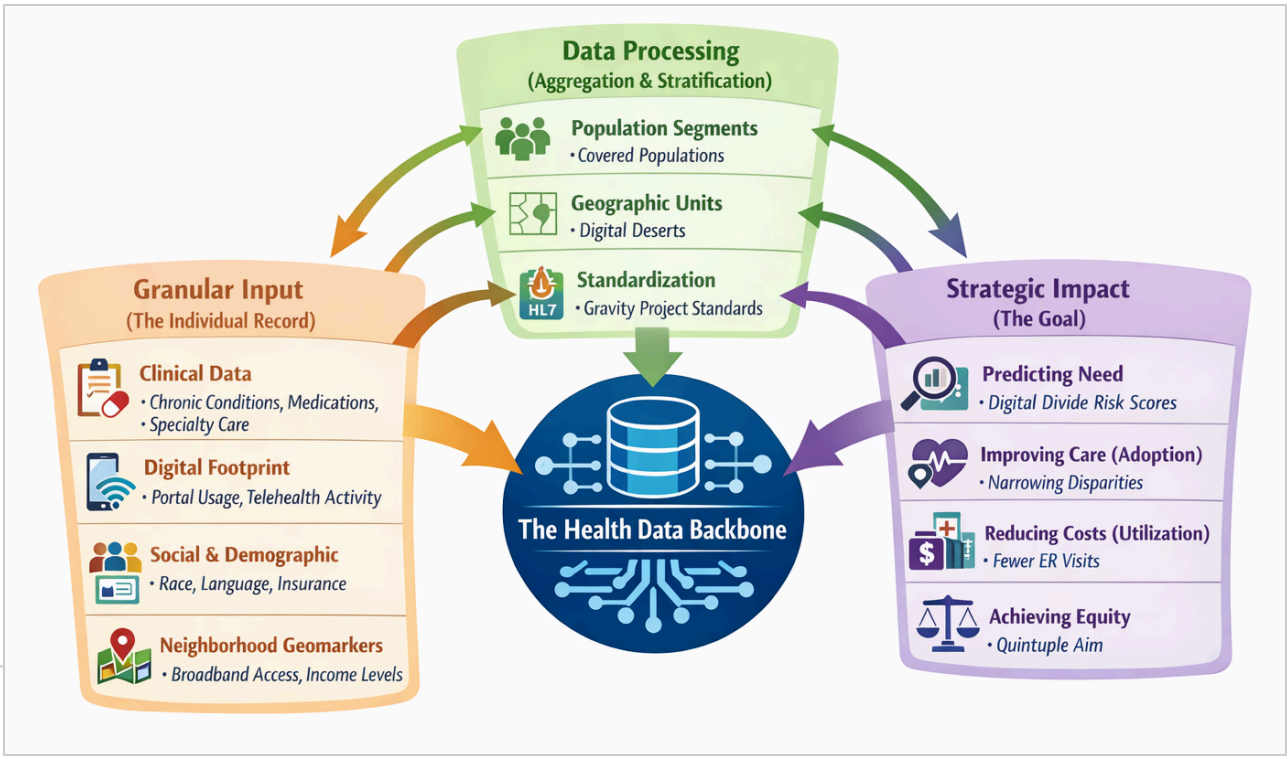

Figure 1: Value of Health Sector Data for Digital Inclusion
[Image generated by the author using ChatGPT]

Mapping stakeholders

Multiple actors influence how digital technologies are deployed within the healthcare system. Public agencies, payers, healthcare organizations, technology companies, and community partners each shape different aspects of digital health adoption.

Understanding the key levers that each can use to promote digital inclusion in the health sector can help identify possible routes for intervention.

Public Agencies

Public agencies regulate and promote healthcare digitalization, but do not generally ensure patient access.

The **Federal Communications Commission** (FCC) supports connectivity for healthcare providers in a number of ways, such as through E-Rate subsidies and the Connected Care Program which funds telehealth pilots (Federal Communications Commission, 2024). However, these funds are not generally available for patient devices or skill training.

The **Food and Drug Administration** (FDA) regulates digital health technologies that often require users to bring their own devices, but rarely considers patient access when issuing approvals.

Congress and the Centers for Medicare and Medicaid Services (CMS) have established payment policies that influence telehealth and remote monitoring adoption. CMS permits health systems to distribute connected devices to patients, but configurations must restrict device capacity for specific, pre-approved clinical uses. When patients receive a fully capable device restricted to a single health application, the patient and the system miss out on benefits that could be obtained at no additional cost. These constraints came from intent to avoid waste, fraud, and abuse. Due to fear of criminal prosecution under the Anti-Kickback Statute and steep civil penalties under the Stark Law, health systems have adopted a conservative interpretation of permissible device use (Office of Inspector General, Department of Health and Human Services, 2020) thus wasting a digital capacity that was paid for with public funds.

Health plans and payers

Health plans and payers influence digital adoption through reimbursement policies and incentive structures. Since passage of the Affordable Care Act, payment models are gradually shifting from fee-for-service (FFS) toward value-based care (VBC) arrangements. Digital tools can replace in-person visits, improving or harming the bottom line, depending on the payment model used and whether the provider or payer perspective is considered. With fee-for-service, the provider is rewarded for the volume of care/services provided. With value-based care, the incentive is to produce better health outcomes at reduced cost. Each model has distinct pathways through which digital adoption could support overall healthcare aims.

Healthcare delivery organizations

Healthcare delivery organizations shape the integration of digital technologies into patient care through decisions about procurement, workflows, and patient support. They are uniquely positioned to identify digital inclusion needs and evaluate the impact of interventions because of the comprehensive patient data they maintain.

However, health systems often do not fully leverage these opportunities to address digital inclusion needs. Technology purchasing decisions rarely prioritize features such as language translation or compatibility with the devices patients already own and use. Implementation workflows may also assume digital proficiency, shifting the burden of troubleshooting to clinical teams that lack specialized training and dedicated time (Fogg & Sinsky, 2023; Ryan, 2023).

Technology providers

Technology developers and vendors shape digital capacity through the design of electronic health record systems, telehealth platforms, devices, and applications. Many digital health tools assume users have reliable connectivity, modern devices, and high levels of digital literacy. These assumptions can limit adoption among populations with fewer resources, particularly those served by safety-net providers (Sheon et al., 2018).

Community-based digital inclusion providers

Many community organizations such as libraries or non-profits offer digital navigation services supporting device access, connectivity assistance, and digital skill training to help patients overcome barriers to digital health technologies. Healthcare organizations are frequently unaware of these resources or lack referral pathways to connect patients with them.

At the same time, generalist digital inclusion programs may feel ill-equipped to support health-specific tools. Library-based digital navigators report that many clients lack confidence in tasks such as scheduling telehealth visits (Campbell & Tikhonov, 2023), while instructors may hesitate to assist with patient portals due to rapidly changing interfaces, concerns about exposure to protected health information, and requests that require clinical judgment (Rana et al., 2025).

Greater collaboration between healthcare systems and community-based adoption programs can address these gaps and enable more patients to engage with digital health services.

Value creation for stakeholders

Closing digital access and literacy gaps enables broader use of digital health services and creates value across the healthcare system. Digital engagement can generate value through several pathways:

- **New or expanded revenue streams**. Under fee-for-service (FFS) models, digital tools allow health systems to deliver care to patients who might otherwise face logistical barriers, physical limitations, or stigma that discourage in-person visits.
- **Cost avoidance and earlier intervention**. Under value-based care (VBC) arrangements, savings accrue when digital engagement supports earlier diagnosis, improved disease management, and care delivered in lower-acuity settings such as primary care rather than urgent or emergency care.
- **Operational efficiency**. Telehealth and portal messaging can reduce missed appointments and streamline routine communication, improving clinical workflow and reducing administrative burden.
- **Workforce flexibility and retention**. Virtual care models allow part-time and remote clinical work, which can help reduce costly employee turnover.

Beyond these direct returns, digital health transformation has important implications for health equity. Technology can reduce barriers that disproportionately affect populations with poorer health outcomes, including rural residents, people with lower incomes, individuals with language barriers, communities of color, and LGBTQIA+ populations. Telehealth, for example, has been associated with significantly fewer no-show visits, particularly among Black patients and those in socially vulnerable areas (Sumarsono et al., 2023). But without intentional digital inclusion strategies, digital health transformation risks exacerbating rather than mitigating health disparities.

Section 3. Measuring impact

Digital inclusion can improve healthcare access, efficiency, and outcomes, but measuring its economic impact presents challenges. Health services research findings are often highly specific to particular clinical conditions, care settings, and populations, and financial impacts vary depending on reimbursement structures. Investments in digital readiness may also generate benefits that accrue over long time horizons or to actors that did not make the initial investment. For example, clinics may invest in digital support while payers capture the resulting savings from avoided hospitalizations.

Evidence from the Department of Veterans Affairs

Striking evidence for the financial value of digital inclusion in healthcare comes from the U.S. Department of Veterans Affairs. The VA implemented integrated electronic health records and telehealth infrastructure more than a decade ahead of most civilian systems, enabling evaluation of the effects of telehealth and remote monitoring on service use and costs. Beginning in 2016, the VA implemented several initiatives to reduce digital access barriers, distributing cellular-enabled tablets, introducing social worker screening for digital access needs, and adding digital skills instruction and technical support to help veterans use video-based care (Heyworth et al., 2024).

An early study showed that elderly homebound veterans randomized to receive equipment for telehealth and home biometric measurement saw significant declines in hospital bed-days and emergency visits compared with controls, demonstrating the mechanism by which digitally enabled care can lower spending (Noel et al., 2004). The VA's national Care Coordination Home Telehealth pilot produced substantial reductions in care utilization and costs among 4,999 individuals with complex care needs compared with 183,872 matched controls. Annual costs for the telehealth group fell by $865 (4%), compared with a $10,118 (48%) increase among the larger group of non-participants (Darkins et al., 2015).

Similarly, a virtual-first exercise program for knee osteoarthritis — with connected tablets provided where needed — meant only one-third of participants ultimately required in-person physical therapy. The modest program cost of $279 per patient was thus associated with less-than-expected need for in-person services (Kaufman et al., 2022). And during the pandemic, nearly 35,000 veterans provided with video-enabled tablets showed increased mental health and substance use treatment and reduced emergency department visits and suicide behavior, suggesting substitution of lower-cost outpatient care for higher-acuity services (Gujral et al., 2022, 2023).

The VA's experience reflects systematic, long-term investment in the full stack of digital inclusion — devices, connectivity, skills, and ongoing support — all of the necessary preconditions for meaningful digital health tool adoption.

A model for estimating ROI

To support dialogue between healthcare organizations and digital inclusion practitioners, Public Health Innovators developed an economic model estimating the return on investment (ROI) from digital inclusion interventions that enable patients to use digital health services. The model components are shown in **Appendix D**.

The model groups 1,000 patients at each of two health systems into three categories based on digital readiness: **Digitally Resilient (D-R)** patients who can use digital health tools with minimal support; **Digitally Supported (D-S)** patients who have devices but require more assistance; and **Digitally Excluded (D-E)** patients who lack the access, skills, or willingness to engage with digital health tools effectively. The two systems differ in their starting mix of these groups. The **Affluent System** serves a predominantly higher-income population with a larger share of D-R patients, while the **Public System** serves a higher-need population with more patients in the D-E category.

The model incorporates investments in digital inclusion support by health systems and community digital inclusion organizations. Health systems provide onboarding support for patients prescribed digital tools (e.g., telehealth or remote monitoring) and ongoing technical support when issues arise. These interventions generate financial returns to the health sector by reducing reliance on high-cost care and enabling patients to build skills and transition from D-S to D-R, lowering support needs over time. Community organizations provide foundational support that enables Digitally Excluded patients to become Digitally Supported. Health systems capture returns from these investments as patients require fewer support resources and increasingly use technology to avoid high-cost care. **Table 1** shows the baseline distribution and the projected shift in each group following health system investment alone, and then from health system investment combined with community-based digital inclusion support.

Table 1. Readiness distribution of 1,000 patients before and after digital inclusion interventions

Scenario	Digitally Resilient **(D-R)**	Digitally Supported **(D-S)**	Digitally Excluded **(D-E)**
Affluent Health System			
Baseline	600 (60%)	200 (20%)	200 (20%)
After Health System Intervention	660 (66%)	150 (15%)	190 (19%)
After HS+ Community Intervention	660 (66%)	240 (24%)	100 (10%)
Public Health System			
Baseline	500 (50%)	200 (20%)	300 (30%)
After Health System Intervention	530 (53%)	170 (17%)	300 (30%)
After HS + Community Intervention	530 (53%)	260 (26%)	210 (21%)
Note: Figures are user inputs; see Appendix D (Table D2)			

The model focuses on savings from costly emergency department visits, hospital admissions, and 30-day readmissions that are averted from digital engagement. Ambulatory savings associated with digital engagement are difficult to model reliably because small per-visit efficiencies applied to high-frequency encounters generate wide uncertainty ranges. Moreover, avoided outpatient visits carry different financial implications depending on whether a system operates under fee-for-service or value-based payment arrangements. High-acuity events avoid both problems: they are discrete, consistently reimbursed on a per-event basis across payment models, and together represent roughly one-third of total healthcare expenditures. Their avoidance produces measurable financial effects that can be attributed to digital inclusion support.

High acuity care refers to costly emergency department visits or hospitalizations that could be avoided if patients use technology to access preventive services or seek lower-cost outpatient care earlier in the disease course.

Ambulatory care refers to outpatient services — visits to primary care, specialty clinics, or telehealth — where patients receive care and return home the same day. These are assumed to reduce the need for high acuity care.

Digitally Excluded patients are assumed to have the highest utilization rates for high acuity events, reflecting greater unmet health needs and more limited access to routine and preventive care. Digitally Resilient patients are assumed to have the lowest usage. Digitally Supported patients sit between the two groups but considerably closer to D-E than D-R, because digital inclusion may improve access without immediately conferring the broader health advantages associated with long-term digital readiness. The gap between D-E and D-R utilization rates is the primary driver of the model's savings estimates, and the D-S group's position within that gap helps explain why community investment, which moves D-E patients to D-S, generates returns that health system investment alone cannot.

Investment assumptions

Table 2 presents the per-patient digital inclusion investment assumed for each readiness group. Health system costs cover direct support for patients using health-specific technologies such as portals, telehealth, and remote monitoring. Community costs cover what it takes to equip and enable a Digitally Excluded individual to engage, including a device, connectivity, and foundational digital skills training. The model recognizes that individuals who are newly engaged or have minimal skills will require more support from the health system to use technology than will an individual who is a long-time user.

Table 2: Per-Patient Digital Inclusion Investment by Readiness Group and Institution

Patient Group	Health System Cost	Community Cost	Combined Cost
Digitally Resilient (D-R)* (Both health systems)	$45	$0	$45
Supported Users (D-S)* — Affluent HS — Public HS	 $200 $100	 $580 $580	 $780 $680
Digitally Excluded (D-E)* (Both health systems)	$300	$0	$300
Total Digital Inclusion Costs per 1,000 patients			
Affluent Health System**	$127,000	$52,200	$179,200
Public Health System**	$132,500	$52,200	$184,700

**Figures are user inputs, see Appendix D (Table D4).*
***Calculated in Appendix Table D5, derived from Tables D2 and D4*

Note: Even though the Affluent Health System spends more for each D-S patient than does the Public System, its overall digital support costs are lower because it has fewer patients in the D-S and D-E groups that require more support (see Table 1).

Two features of **Table 2** shape the results in important ways. First, the Affluent System invests twice as much per Digitally Supported patient as the Public System ($200 vs. $100), reflecting more available resources. This gap drives meaningfully different transition rates between the two settings. Fewer D-S patients in the Public System reach D-R status as a result, which limits savings. Second, the $300 spent supporting Digitally Excluded patients by either system generates very little utilization reduction. Patients in that category lack the foundational access and skills needed to benefit from health system support in the absence of community investment. Community investment is what moves D-E patients into the D-S category, and that transition is where the largest potential gains are found.

The model also allows for a small number of organic transitions in the Affluent System, with 10 D-E patients shifting to D-S without formal investment. This reflects theories of technology diffusion, which predict that informal adoption pathways such as family support, peer influence, and ambient exposure to digital tools are more common in environments with higher baseline connectivity and stronger social reinforcement (Rogers, 2003; Venkatesh et al., 2012). No organic transitions are assumed in the Public System, given the scale of structural barriers present.

Return-on-investment (ROI) perspectives

> **ROI is calculated as:**
>
> *(Savings from reduced high-acuity care – Investment costs) ÷ Investment costs*

The model calculates ROI from two distinct vantage points.

Perspective 1 considers health system costs and savings only. Returns are driven by the transition of 60 patients in the Affluent System and 30 in the Public System from D-S to D-R as a result of health system investments along with savings from organic D-E to D-S transitions of 10 patients in the Affluent System.

Perspective 2 adds the savings generated when 90 patients in each system transition from D-E to D-S through community digital inclusion investment. It does not include the community investment cost in the denominator. This reflects a common real-world pattern in which health systems benefit financially from cross-sector digital inclusion investments they did not fund and may not even be aware of.

Full model assumptions, scenario parameters, and intermediate calculations are presented in **Appendix D**.

What the model shows

Health systems are currently realizing financial returns from community digital inclusion infrastructure without contributing to its cost. The divergence in ROI results between Perspective 1 and Perspective 2 in each scenario quantifies this dependency.

For the Affluent System, the health system's own investment generates a modest positive return (17.5%). When the benefits of community investment are also credited to the health system, without being counted in the cost calculation, the ROI rises more than fivefold to 88.4%. A difference of that magnitude changes the conversation: a 17.5% return requires careful justification, while an 88.4% return should be hard to forego.

The Public System results are also striking. Under Perspective 1, the health system's investment generates a negative return (-47.5%), driven by two reinforcing constraints: lower per-patient support investment yields fewer D-S to D-R transitions that generate larger returns, and the higher proportion of D-E patients continues to generate high acuity care expenses because foundational barriers prevent effective digital health engagement. Under Perspective 2, the ROI turns positive (20.5%). This shift underscores that, in public system settings, health system digital inclusion investment returns are critically dependent on community digital inclusion infrastructure.

The returns shown in **Table 3** are based on middle-of-the-road modeling assumptions. Using more optimistic assumptions, that increasing health system investment in D-S patients to $400 per year would move all D-S patients to D-R status, or that raising community investment to $800 per person would move every D-E patient to D-S, the combined return measured against health sector costs alone would greatly increase. Moreover, to maintain simplicity, the model captures only first-year effects of digital inclusion support and does not account for additional value generated as digital skills accumulate over time.

Across a range of assumptions, the greatest potential returns are with patients who are most likely to obtain high-cost care for preventable conditions. Health systems are now adept at predicting which patients are likely to incur high medical costs but have had limited success in reducing their care costs (Rinehart et al., 2018; Shemesh et al., 2021). Partnerships with digital inclusion practitioners could enable patients to overcome access and engagement barriers that have hampered prior efforts.

Table 3: ROI for Two Investment Perspectives

ROI Perspective	Investment	Costs Averted	ROI*
Perspective 1	**HS Only**	**From HS investment only**	
Affluent System	$127,000	$149,172	17.5%
Public System	$132,500	$69,583	-47.5%
Perspective 2	**HS Only**	**From HS and community investments**	
Affluent System	$127,000	$239,222	88.4%
Public System	$132,500	$159,633	20.5%

**Calculated using the formula:*
(Averted high-acuity event total costs - Health system investment)/Health system investment

See Appendix D (Table D1). Averted high acuity event costs calculated from D3, D6, D7, D8, D9, D10. Health System Investment costs calculated in D5 from D2 and D4.

Notes and limitations

These findings are intended as proof of concept and should be interpreted as illustrative. Results depend on assumptions about baseline utilization rates, event costs, the distribution of digital readiness, the costs of digital inclusion services, and the timing and magnitude of averted events, all of which vary substantially by setting. The model should be adapted using local data wherever possible, but a pilot study to assess the actual costs and savings from digital inclusion efforts would be even better.

A structural feature of healthcare financing also warrants attention. Savings from avoided hospitalizations accrue primarily to payers (insurers, employers, and government programs), while the costs of digital inclusion work are often borne by providers and community organizations. This misalignment means that appeals for community-based digital inclusion funding are better directed to payers than to providers, especially in safety-net settings where provider margins are already thin.

The model provides a practical framework for initiating a financial conversation grounded in the outcomes health systems already measure and the costs they are already working to reduce.

Section 4. Case studies of emerging partnerships

The economic modeling in Section 3 demonstrates that digital inclusion can generate measurable value within healthcare systems if patients can be enabled to use technology to reduce high-cost utilization. Healthcare payers invest substantially in digital health technologies but these investments deliver value only when patients have digital capacities that are financed outside the healthcare sector.

This creates both a challenge and an opportunity for digital inclusion practitioners. Effective digital care depends on infrastructure that spans multiple sectors, including health systems, community organizations, technology vendors, and public programs. The examples below illustrate ways in which actors are beginning to share responsibility for financing and delivering the digital access and support that effective digital healthcare requires, and ways this can be developed further.

Community-based support for digital healthcare

These examples can help demonstrate the potential for digital inclusion to generate health sector savings that could be reinvested in sustaining community-based infrastructure.

The Click to Connect project (2007–2010) offers an early and instructive example. One of the first randomized controlled trials designed to expand online access to health information among low-income adults provided participants with connected devices and digital literacy training through a community-based adult education organization rather than a healthcare provider (Nagler et al., 2013).

The scale of support required was striking. Of 155 participants, 154 required at least one technical support interaction, with a median of twelve interactions per person. The most common challenges, including unstable internet connections, malware, password management, and hardware failures, were not health-specific, but they directly determined whether participants could access health information online. Project staff resolved most issues in-house rather than outsourcing support, keeping costs down and building trust through repeated contact.

Updating this model nearly a decade later, a public hospital (MetroHealth System), assigned a trained community health worker to identify barriers to patient portal use among 186 patients. 55% of them were referred to digital navigators at the Ashbury Senior Computer Community Center for devices, connectivity, basic and portal skill training. First-time portal use increased three-fold and portal-based visit scheduling increased twice as much after the program compared with changes in a control location without the screening and referral process (Berg et al., 2018).

Health systems that deploy remote health services without appropriate digital inclusion support are building on an unstable foundation. This gap is an effective entry point for partnerships with community-based digital inclusion services.

The cost of assuming digital readiness

Sometimes the clearest argument for cross-sector partnership comes from breakdowns. Consider Edward[1], a retiree who was prescribed a continuous glucose monitoring system to help manage pre-diabetes. He successfully applied the glucose sensor to his arm but was unable to connect the device to his smartphone so that he could see his blood sugar levels in real time.

After hours of frustration, he figured out that his Android phone was not on a list of compatible devices that he found online. He located an older, discarded iPhone and spent several hours with a knowledgeable friend updating its operating system, creating an Apple ID, and learning the interface. The clinical team that prescribed glucose monitoring provided no guidance on device requirements and had no workflow for identifying or resolving compatibility issues.

Once operational, seeing his blood sugar levels in real time was revelatory. He tested making small adjustments to his diet and activity, and within weeks, his glucose levels returned to a healthy range without medication. Figure 2 shows a 24-hour glucose reading when he started and after using the device for a few weeks. His success later prompted peers in a support group to ask their own doctors about sensors as an alternative to medication.

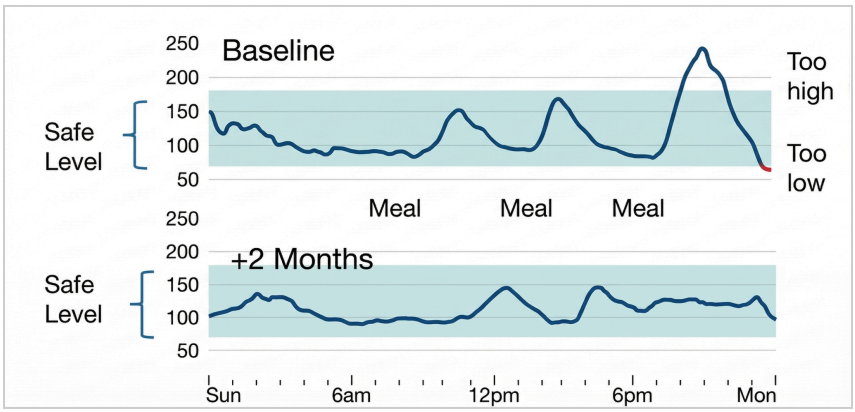

Figure 2: 24-hour glucose monitor results at baseline and 4 weeks later

[1] The author served as the digital navigator in this case, and the subject authorized publication of their experience, with details modified for confidentiality.

What could have become an abandoned digital health prescription became a clinical success because Edward had the persistence, digital skills, and social connections to overcome technology barriers.

The case highlights a structural problem. Insurers may spend $4,000 per year on a patient's connected sensor and clinical data review, yet fail to ensure that patients have the devices, skills, and health literacy needed to translate the data into behavioral changes that could reduce the estimated $12,000 annual excess healthcare costs associated with diabetes (Parker et al., 2024). Unlocking this value requires human and technical infrastructure available from community-based practitioners.

Edward's case points to clear system-level fixes: screening for device access and digital literacy prior to prescribing connected technologies, requiring vendor interoperability across devices, and partnering with community organizations to address gaps. These changes depend on recognizing digital readiness as a clinical precondition and moving toward shared responsibility for building and sustaining the infrastructure that enables patients to engage effectively.

Connectivity as a clinical resource

Some healthcare systems have begun treating connectivity and device access as core components of care delivery, a framing that creates direct openings for digital inclusion partnerships.

During the COVID-19 pandemic, emergency departments in three Toronto hospitals implemented a program to distribute basic cellphones with prepaid service to patients who lacked reliable contact information (Hodwitz et al., 2024). Staff screened patients for eligibility and provided phones equipped with SIM cards and six months of service. Patients used the devices to attend telemedicine appointments, access public health services, contact addiction counselors and social workers, reach suicide hotlines, and stay connected with family.

Clinicians reported improved discharge planning, stronger patient engagement, and reduced moral distress associated with releasing patients who could otherwise not be reached after discharge. These effects were associated with lower care costs. Operational challenges, including limited device supply and high rates of phone loss among patients with unstable housing, reflected the pilot nature of the program rather than inherent flaws in the approach (Hodwitz et al., 2024).

The Toronto program demonstrates the value of treating connectivity as a clinical resource. It also illustrates how community organizations can be vital partners for health systems in addressing the social factors that complicate implementation, such as housing

instability, isolation, and resource scarcity. However, scaling up pilot programs to meet health system-wide needs requires planning and resources.

From population assessment to patient need

Health systems need systematic ways to identify digital barriers at both population and individual levels. Insights from population-level data inform strategic priorities and resource allocation. At the patient level, they enable tailored support within clinical care. Community Health Needs Assessments (CHNAs) and clinical screening offer distinct but complementary mechanisms to achieve this alignment.

CHNAs operate upstream, at the level of institutional strategy. Nonprofit hospitals are required to conduct CHNAs every three years to identify priority health needs (Department of the Treasury, 2025), while state and local public health agencies typically conduct similar assessments every five years (Centers for Disease Control & Prevention, 2022). Many public health departments use their assessments to inform Health Improvement Plans. When highlighted in these processes, digital inclusion becomes a fundable strategic priority, creating institutional incentives for partnership that do not depend on individual champions.

This recognition is beginning to happen. Cuyahoga County public health and health systems first added questions about digital access to care in their 2022 consolidated survey, and one Cleveland health system subsequently highlighted a partnership with a local nonprofit internet provider in its 2025 assessment. Colorado incorporated digital access questions into its 2023 statewide assessment and later published findings emphasizing telemedicine access. This shift, though gradual, provides opportunities for digital inclusion practitioners to advocate for integration of device access, connectivity, and digital literacy support into health system priorities. CHNA community input sessions, advisory councils, workgroups and surveys all welcome constructive input.

Clinical screening, meanwhile, operates at the individual level, focusing on patient-by-patient identification of need. Over the past decade, screening and referral to services addressing other social needs that affect health have become routine strategies for reducing healthcare system costs and disparities in care access (Angah et al., 2024). Yet, despite growing reliance on virtual care delivery, few health systems have added digital access and literacy needs assessment to social needs screening (Shih et al., 2026).

The Cleveland Clinic's experience pilot testing digital readiness screening and referral reveals that the concept is at an early stage of maturity. Following the screening of 2,993 patients, 554 were identified with digital needs, yet only 27.6% of those subsequently surveyed ultimately obtained the needed support. Gaps identified in the pilot, including

the need for follow-up protocols, patient transportation, and assistance documenting service eligibility show that converting referrals into access requires ongoing collaborations between health systems and community organizations (Rana et al., 2025).

This gap between identification and services is where digital inclusion practitioners can make their most direct case to health system partners, offering a layer of embedded human support for both effective identification of need and service delivery.

The human touch of digital support

The importance of human support for technology adoption is vital, with patients placing high value on individualized attention, trust, and sustained follow-up (Hsu et al., 2020).

Individuals with the lived experience of digital exclusion must contribute to the design of solutions intended to benefit them. Oregon Health & Science University is advancing this principle through CO-LED, Community Organization Led Equity by Design. With an explicit commitment to confronting and repairing the effects of historical and contemporary injustice, the university engaged seven community organizations for a year-long human-centered process to design digital solutions. Several are now undergoing prototype testing (Rodriguez et al., 2023).

The ACTIVATE project also illustrates the human dimension of digital inclusion (Kim et al., 2023). Partnering an academic health system and a health plan with community organizations serving primarily Latino agricultural workers in California, the initiative used *promotoras* (Spanish-speaking community health workers) to conduct outreach and telehealth education during the pandemic. A structured "train-the-trainer" model, including role-playing exercises, facilitator guides, and culturally tailored multimedia materials helped community members build confidence in telehealth technologies and address skepticism about virtual care. The program worked because it operated through existing trusted relationships.

Community health workers (CHWs) and patient navigators represent underutilized infrastructure for digital navigation at scale. CHWs are already integrated into care delivery across many health systems, and most states allow reimbursement for their services through certification pathways. They are trusted, often multilingual, and embedded in the communities health systems struggle to reach. Patient navigators commonly help people obtaining cancer care. Yet neither CHW nor patient navigator training and certification programs teach or require digital navigation competencies (President's Cancer Panel, 2024). Policy is beginning to move in this direction. Massachusetts has pending legislation for statewide credentialing of digital navigators, potentially the first such recognition in the United States (An Act Establishing a Commission to Study a Statewide Credentialing Program for Digital Navigators, 2025).

The National Consortium of Telehealth Resource Centers has developed programs specifically focused on telehealth and patient portal navigation. These developments signal growing institutional appetite for a formal digital navigator role within healthcare and a corresponding opportunity for community digital inclusion organizations to help define and supply that workforce.

Together, these examples underline that the clinical and economic value of digital health tools depends on the surrounding human and technical infrastructure, often provided by community-based digital inclusion organizations. Examples and strategies in this Chapter are intended to help make a compelling case for cross-sector partnership.

Section 5. Navigating sector opportunities

The preceding sections make the case for partnerships between digital inclusion organizations and healthcare systems and identify key partnership opportunities. This section addresses the practical questions of where to start and how to build relationships.

Finding the right partners

Consider the alignment of your organization's scope, scale, reach, and population expertise with a potential health system partner's patient mix. Experience serving older adults, immigrants, people returning from incarceration, or with disabilities, for example, is a valuable competency. Many digital inclusion service providers may be especially proficient in serving populations that seek care from safety-net providers, including Federally Qualified Health Centers, rural hospitals, and veterans facilities. Mental and behavioral health providers are a particularly high-value entry point because patients often require frequent visits that could be conducted over telehealth, yet face acute digital access barriers.

Directories of health facilities and professional associations are provided in **Appendix B**.

Building relationships

Partnerships benefit from alignment around a clearly defined problem. Digital inclusion practitioners can start by understanding a health system's strategic priorities, listening to operational pain points, and identifying available assets that can contribute to solutions. This enables a clear articulation of the value proposition they bring, including access to and credibility with the populations served. Such capabilities hold great value for key health system stakeholders such as universities, regulators, and foundations. Digital inclusion should be positioned as a means of advancing institutional goals rather than as a philanthropic request.

Pilot projects and joint grant proposals offer opportunities for both parties to better understand each other's operations and build relationships that can engender trust. As relationships develop, digital inclusion practitioners can offer concrete support across several areas: community-based screening for digital readiness, building referral pathways for addressing identified needs, training health professional staff in digital inclusion methods, and collaborating on providing digital health skills training aligned with clinical care plans.

Speaking the health system's language

Most health system leaders consider The quintuple aim (see Section 2) as a strategic North Star for priority setting and evaluation. Linking digital inclusion to its five domains: 1)

improving population health, 2) enhancing care experience, 3) reducing costs, 4) supporting provider well-being, and 5) advancing health equity enables alignment of digital inclusion to existing performance objectives.

In practice, the most productive early conversations focus on operational pain points: technology that is poorly matched to user needs, the need for training on digital skill acquisition techniques, awareness of digital inclusion resources, digital tools that generate the most patient troubleshooting burden, population groups and neighborhoods where non-engagement rates are highest, and programs that underperform relative to expectations. A more advanced set of conversations can delve into opportunities to leverage insurance reimbursement for digital inclusion services such as engaging family caregivers and home health support aides as digital proxies, creating a win-win for health systems and communities. These discussions position digital inclusion organizations as partners in solving problems health systems are already trying to fix.

The ROI framing described in Section 3 helps ground the financial argument. The model makes visible the substantial financial benefits that community-based digital inclusion organizations can bring to health systems. To help sustain and expand these benefits, health sector stakeholders can leverage resources to support digital inclusion infrastructure, in their own economic interests. Making that relationship explicit reframes the partnership from charitable contribution to mutual interest.

A discussion guide with suggested conversation starters for initial meetings with health system leaders is provided in **Appendix C**.

Conclusion

This chapter has made the case that patient use of digital health tools can generate measurable financial value to the health sector, but only when patients have access to devices and support for basic and health-specific digital skills. Health systems can most easily support patients that already have foundational digital access and literacy to use technology. Yet failure to address foundational digital inclusion gaps risks increasing health disparities. Patients who could experience the greatest health gains from using technology offer the most potential for generating health sector savings. However, health systems lack the personnel, core competence, and institutional mandates needed to address basic patient digital access and skill needs. Community-based digital inclusion support can get patients to the access threshold needed to benefit from support that health systems can provide for health-specific technology use. Those community efforts are largely funded outside of, and invisible to the health sector. As a result, health systems and payers capture the resulting savings and performance gains, while organizations funding and providing digital inclusion services receive little recognition or financial return.

The ROI model in Section 3 puts numbers on that imbalance. In both an affluent and a public health system scenario, the health system's own investment in patient digital support produces only modest returns — and in the public system, negative ones. What changes the picture is community-based investment in devices, connectivity, and foundational skills. Once that foundation is in place, the same health system spending generates returns several times higher. Therefore, rather than being a ‘nice-to-have’ sitting alongside the health sector's digital strategy, community-based digital inclusion support is a precondition for this strategy working.

This has implications for how partnerships are framed. The examples outlined, from the VA's early investments in digital enablement to Cleveland Clinic's digital readiness screening, succeed because they treat connectivity, devices, and human navigation as clinical infrastructure rather than philanthropy. By reinvesting savings or resources from existing mechanisms, including value-based contracts, community benefit spending, and CMS reimbursement pathways, into community-based programming, the health sector can reap significant rewards. The conversation that produces durable partnerships is not "will you fund our program" but "here is the return your institution could capture when all of your patients are able to use your technology."

Federal insurance coverage reductions and financial pressure on safety-net providers are intensifying the search for efficiency across the sector. Community-based digital inclusion providers have been largely overlooked as a source of value generation for the health sector. Engaging health systems and community organizations into the same budget conversation is the work ahead.

The appendices that follow offer practical tools for this work, including a list of leading health scholars focused on digital inclusion; stakeholder directories for identifying partners; a conversation guide for initial meetings with health system leaders; and the complete ROI model that can be customized with local data and used directly in partner conversations.

WHAT TO READ NEXT

The series

The Framework, *Samantha Schartman & Brian Vo*
The case for change and the financial framework the series is built on, including Connect Humanity's approach to structuring co-investment partnerships.
connecthumanity.fund/alt-funding-guide/framework/

Education, *Dr. Jen Vanek & Samantha Schartman*

How digital access drives outcomes across K–12, postsecondary, and adult education — and why co-investment is needed to sustain it.
connecthumanity.fund/alt-funding-guide/education/

Housing, *Catherine Crago Blanton*

How housing authorities and affordable housing providers can build digital access into their core operations.
connecthumanity.fund/alt-funding-guide/housing/

Local government, *Aaron Schill & Abi Waldrupe*

How local government investment in digital inclusion generates returns across public services — and the case for municipal co-investment.
connecthumanity.fund/alt-funding-guide/local-government

Telecommunications, *Brian Rathbone, Doug Dawson, Jeff Sural & Samantha Schartman*

Why ISPs already have a business case for digital inclusion — and how partnerships can generate more sustainable funding.
connecthumanity.fund/alt-funding-guide/telecommunications/

Workforce development, *Samantha Schartman & Dr. Roberto Gallardo*
Employer and workforce system investment in digital skills as a talent and economic development strategy.
connecthumanity.fund/alt-funding-guide/workforce-development/

Get in touch
If you are a practitioner exploring co-investment partnerships, a sector partner thinking about how this framework applies to your organization, or a funder considering supporting pilots, let's talk: **info@connecthumanity.fund**

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Appendices

Appendix A: Thought leaders on digital inclusion in healthcare

Table A1: list of digital inclusion thought leaders in healthcare

Group / Person	Key works
University of California San Francisco (UCSF) Long-standing leaders on digital health equity in safety-net settings; home to the Social Interventions Research and Evaluation Network (SIREN).	• **Lyles C*, et al. (2022).** Bridging the Digital Health Divide: How designers can create more inclusive digital health tools and how providers and plans can help communities better adopt health tools | Link • **Khoong EC, et al. (2025)**. Centering Health Equity in an Increasingly Digital Environment | Link *Now at UC Davis
Ohio State University Pioneers in using EHR and portal data to identify digital adoption needs and evaluate inpatient portal interventions.	• **Huerta T, et al. (2019)**. Patient engagement as measured by inpatient portal use | Link • **McAlearney AS, et al. (2021).** Examining Patients' Capacity to Use Patient Portals: Insights for Telehealth | Link
National Academies of Sciences, Engineering & Medicine Independent advisor to the U.S. government; publishes influential reports on health equity, health literacy, and technology.	• **National Academies of Sciences, Engineering, and Medicine. (2025).** Advancing Equity in Diagnostic Excellence to Reduce Health Disparities: Proceedings of a Workshop—in Brief. | Link • **National Academies of Sciences, Engineering, and Medicine. (2023).** Toward Equitable Innovation in Health and Medicine: A Framework | Link
Michael C. Gibbons Physician-informatician and early architect of evidence-based, community-centered approaches to digital health inclusion.	• **Gibbons, MC. (2005).** A historical overview of health disparities and the potential of eHealth solutions | Link • **Gibbons, MC, et al. (2017).** Applying human factors principles to mitigate usability issues related to embedded assumptions in health information technology design. | Link
Jorge Rodriguez Clinician-researcher advancing equitable digital care models, navigator integration, and federal digital health equity policy.	• **Rodriguez JA, et al. (2022)**. Digital Inclusion as Health Care — Supporting Health Care Equity with Digital-Infrastructure Initiatives | Link • **Rodriguez JA, et al. (2023).** Digital Healthcare Equity in Primary Care: Implementing an Integrated Digital Health Navigator | Link
John Torous Digital mental health leader whose work has defined the digital navigator role and standards for safe, equitable mental health app use (with Hannah Wisniewski)	• **Alon N, et al. (2024)** Digital Navigator Training to Increase Access to Mental Health Care in Community-Based Organizations | Link • **Torous J, et al.(2020)**. Digital Mental Health and COVID-19: Using Technology Today to Accelerate the Curve on Access and Quality Tomorrow Link

Appendix B: Stakeholder directory

Table B1: Directories of Health Facilities with Identified Digital Inclusion Relevance

Healthcare Facilities	What it is	Why it matters for digital inclusion
Safety-Net, Rural, Veterans and Tribal Health Facilities and Public Health Agencies		
Health Resources and Services Administration Find Federally Qualified Health Centers (FQHC) or FQHC Look-Alikes	Safety-net facilities serving low income and uninsured patients, often with federal support	Few such facilities have the resources to address patients' digital access and literacy needs. However, most will have a common EPIC-based EHR system.
National Association of Free & Charitable Clinics Free Clinic Directory	Free and charitable clinics for uninsured and unhoused patients	Patients have high digital exclusion and facilities may have minimal IT systems and support.
U.S. Department of Veterans Affairs VA Facility Locator	VA medical centers and outpatient clinics	Facilities have mature virtual care and digital inclusion models.
Centers for Medicare & Medicaid Services Rural Health Clinic List & Critical Access Hospital List	Medicare-designated rural health clinics and rural hospitals	Rural health systems in particular may have limited virtual care infrastructure, and patients may have infrastructure barriers to care.
Rural Health Information Hub Rural Health Services Locator	Aggregated rural provider locator	Rapid mapping across rural provider ecosystems.
Indian Health Service IHS Facility Locator	Tribal and Urban Indian health facilities	Sovereignty-aware digital inclusion partnerships.
National Association of County & City Health Officials Health Department Directory	County and city health departments	Mandatory community health needs assessments offer an opportunity for digital inclusion advocates to surface digital inclusion needs as a public health priority. Surveillance data can illuminate the link between individual and community digital inclusion and health risks, outcomes and disparities.
Mental health and behavioral health service providers		

Substance Abuse and Mental Health Services Administration – Behavioral Health Treatment Services Locator	National directory of mental health and substance use providers	Telehealth-dependent care with high digital barriers.
State Mental Health Authority (SMHA) Directories	State-run safety-net public mental health providers	Individuals with serious mental illness can benefit greatly from virtual care but have intensive and specialized digital inclusion needs.
State Substance Use Authority (SSA) Directories	State-run substance use treatment providers	Populations needing frequent treatment services that are greatly facilitated through digital inclusion.
Certified Community Behavioral Health Clinics (CCBHCs) Listing	Federally certified comprehensive behavioral health clinics	Addressing serious mental illness and substance abuse treatment benefitting from virtual care.

National professional associations and standards initiatives play a critical role in shaping how digital inclusion is operationalized, financed, and measured within healthcare delivery systems. Conferences, regional collaboratives, and state or local health planning processes often surface decision-makers engaged in digital transformation. Key organizations are listed in Table 2.

Table B2: Professional Associations and National Digital Health Initiatives

Organization	What it is	Why it matters for digital inclusion
OCHIN (Formerly: Oregon Community Health Information Network)	Nonprofit health IT collaborative providing EPIC EHR infrastructure to safety-net providers.	Enables resource-constrained health systems to offer a version o MyChart to patients. The organization has received considerable grant funding for digital inclusion support.
National Consortium of Telehealth Resource Centers (NCTRC)	Network of federally funded regional Telehealth Resource Centers (TRCs)	Practical, no-cost technical assistance for rural and safety-net telehealth.
Healthcare Information and Management Systems Society (HIMSS)	Global health IT professional association	Standards, workforce training, and digital equity policy leadership.

Digital Medicine Society (DiMe)	Professional society for digital medicine evidence and practice	Evidence standards for digital therapeutics, remote patient monitoring and patient-generated data. One project collected resources targeted at inclusive technology development and deployment.
College of Healthcare Information Management Executives (CHIME)	Association of CIOs and senior health IT leaders	Access to decision-makers controlling digital investment priorities.
Assistant Secretary for Technology Policy (ASTP/formerly ONC)	Federal health IT policy, interoperability, and standards office	Sets interoperability, usability, and patient access expectations.
Gravity Project	Collaborative develops standards for collecting and sharing information about SDOH between health systems, payors, regulators and community partners	Enables standardized capture of digital access and literacy needs, essential to scale digital readiness screening, referral for gaps, and to enable payer reimbursement for digital navigation and skill training.
Social Interventions Research and Evaluation Network (SIREN)	Network of researchers focused on integrating social needs with health care	Collects and publishes evidence and implementation guidance for screening and referral for social needs within healthcare settings.
American Medical Association	Supports members with professional education and policies; focus on usability, bias mitigation and equitable implementation	Health equity resources; digital health portfolio includes implementation guides and training; Augmented intelligence in healthcare; owns and licenses the Current Procedural Terminology (CPT) code set, the universal data dictionary for medical billing, that is needed to allow insurance reimbursement for identifying and addressing digital readiness gaps.
Association of State and Territorial Health Officials (ASTHO) Directory	Develops public health leaders, improved capacity	State-level policies about health and Medicaid; align Broadband Equity Access and Deployment (BEAD) and digital equity plans with state health plans. Technical assistance services offered.

Appendix C: Conversation guide

1. Strategic Value of Digital Tools

- Which digital tools (e.g., portals, telehealth, remote monitoring) deliver the greatest value to your patients and your organization?
- Who is using them — and who is not?
- How do you assess adoption and impact across different populations?

2. Patient Barriers and Gaps

- What barriers do patients face in using digital health tools?
    - Connectivity or device limitations?
    - Foundational digital literacy gaps?
    - Challenges specific to virtual health platforms?
- Do different populations experience distinct barriers or respond to different engagement strategies?

3. Workforce Capacity and Operational Pain Points

- Who supports patients with technology use (e.g., CHWs, navigators, clinical staff)?
- What training do they receive?
- Where do staff encounter friction — troubleshooting, onboarding, portal messaging volume, workflow disruptions?
- Are there opportunities to offload or streamline these responsibilities?

4. Screening, Workflow, and Referral

- Do you screen patients for digital readiness?
    - Who conducts screening and where does it fit in workflow?
    - What happens when gaps are identified?
- Do you screen patients for other social needs?
    - Do you have a system for referring patients and tracking the referrals?
- How do you onboard patients to digital tools?
    - Do you assess whether they have the device, connectivity, and skills required?
- Are there community organizations you partner with to address foundational access and literacy needs?

5. Technology Procurement and Co-Design

- How are decisions made about procuring or developing new digital technologies?
- Are patients engaged in design, implementation, or usability testing?
- Do those patient participants reflect individuals with limited digital skills or constrained access?

- Would there be interest in collaborating to identify and prepare patients with known digital barriers to participate in technology testing and co-design — ensuring tools are usable, equitable, and impactful from the outset?

6. Sustainability and Reimbursement

- Are you leveraging reimbursement pathways to support digital onboarding, navigation, or caregiver technology support?
- Could digital navigation be embedded within existing reimbursable roles or care models?

7. Potential Next Steps and Collaborative Opportunities

- Pilot a digital readiness screening and referral workflow.
- Map and formalize referral pathways to community-based digital inclusion partners.
- Co-develop digital health skill-building programs aligned with clinical care plans.
- Engage patients with digital barriers in structured co-design initiatives.
- Explore joint funding opportunities or value-based pilots tied to measurable outcomes.

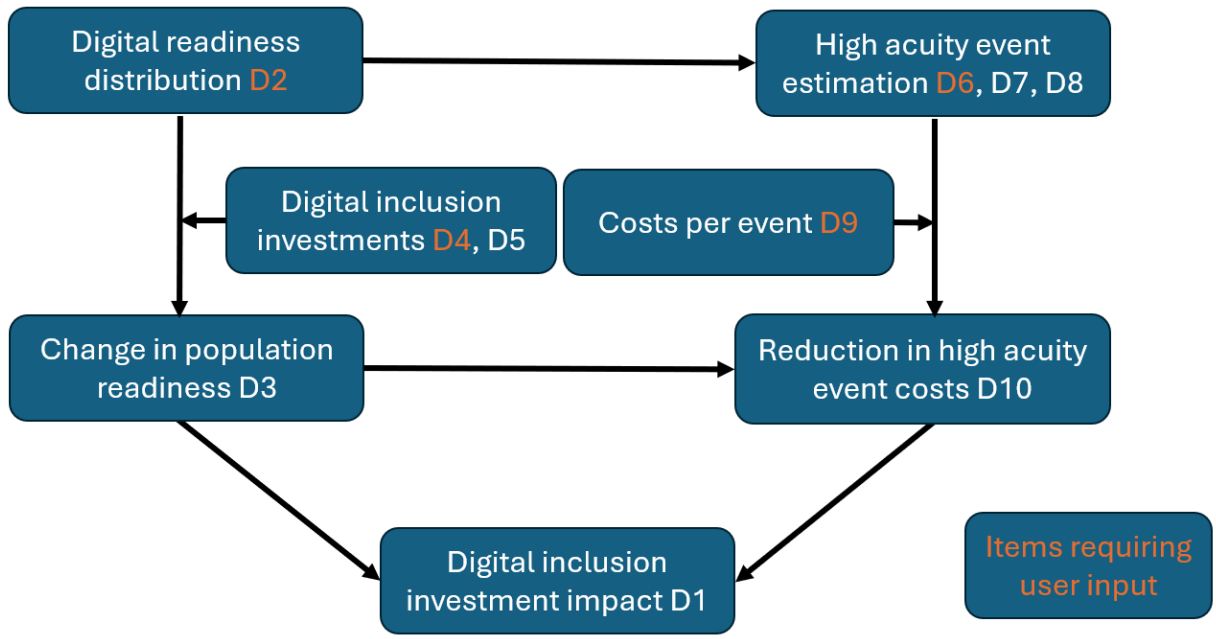
Appendix D: Economic model structure and formulas

Table D1 below shows the final model outputs for two ROI scenarios for each health system type. The "HS investment only" considers the health system cost of providing onboarding and technical support to patients, and the savings from the high-acuity events averted by the patients that transitioned from Digitally Supported to Digitally Resilient. In the second ROI perspective, the averted costs add those saved by the 90 people per hospital that transitioned from Digitally Excluded to Digitally Supported.

Table D1. Final ROI summary

Health system	Investment scenario	ROI perspective	Averted high-acuity event cost	Health-system DI investment	ROI
Affluent HS	HS investment only	HS:HS	$149,172	$127,000	17.5%
Affluent HS	HS + community investment	HS+C:HS	$239,222	$127,000	88.4%
Public HS	HS investment only	HS:HS	$69,583	$132,500	-47.5%
Public HS	HS + community investment	HS+C:HS	$159,633	$132,500	20.5%
These figures are used in Section 3 (Table 1)					

Figure D1: overall schematic for the model



Tables D2-9 step through the calculations used to reach the final ROI numbers. Items shaded in yellow are inputs that users could modify to match their own populations.

Tables D2-3 address the patient distribution by level of digital readiness, with and without digital support. Table D2 is where a model user would input the digital readiness distribution of their patient population at the present time, and then step by step, to show the number they believe would be in each category based on health system investments, and then after community support is considered. The table demonstrates two scenarios but a model user would only need to consider their own situation. At the affluent health system in the example, the health system investment row also reflects that 10 individuals shifted from Excluded to Supported not because of the health system's efforts but because of support from family and friends, or technology access at work, or because general exposure to a norm that expects people to be engaged.

Table D2. Population distribution by digital readiness

Scenario	Digitally Resilient	Digitally Supported	Digitally Excluded	Total
Affluent: Baseline	600	200	200	1,000
Affluent: +Health System Investment	660	150	190	1,000
Affluent: HS + Community Investment	660	240	100	1,000
Public HS: Baseline	500	200	300	1,000
Public HS: +Health System Investment	530	170	300	1,000
Public HS: HS + Community Investment	530	260	210	1,000

Table D3 shows the expected number of patients that would transition between groups due to health system and community support. The figures were derived from simple subtraction between the rows of Table D2.

Table D3: Patients transitioning to higher digital readiness state

Scenario	Supported to Resilient users	Excluded to Supported users	Total moving	Formula basis
Affluent: +HS	60	10	70	Compared with affluent baseline
Affluent: HS+Comm	60	100	160	Compared with affluent baseline
Public HS: +HS	30	0	30	Compared with public baseline
Public HS: HS+Comm	30	90	120	Compared with public baseline

Tables D4 and D5 show digital investment requirements. Table D4 shows the costs estimated by the author for health systems to provide onboarding and technical support for patients at each level of digital readiness, and by the community for enabling a patient to transition from Digitally Excluded to Digitally Resilient. The author derived these estimates based on published literature, her own patient experience, and that observed

through her work with health systems and digital navigators. The model assumes that each health system spends $45 per year to support every Digitally Resilient patient, reflecting a small amount of time clinical and technology support staff members. Affluent systems are assumed to be able to devote more resources ($200 worth of staff time) helping Digitally Supported patients whereas public systems are presumed to have only $100 to support patients in this category. At both systems, Digitally Excluded patients are presumed to require even more health system assistance, costing $300 per person.

For both systems, we assume that community digital inclusion organizations provide devices and support valued at $580 per person for each patient that they enable to transition from being Digitally Excluded to Digitally Supported. Again, a model user would update these inputs for their own institutions' costs.

Table D4. Digital investment cost per patient by readiness group

Category	Digitally Resilient	Digitally Supported — affluent	Digitally Supported — public	Digitally Excluded
Health-system expenditures	$45	$200	$100	$300
Community support for patients that transitioned from Excluded to Supported*	$0	$580	$580	$0
Health system + community expenditures	$45	$780	$680	$300
**Community expenditure only applies to the 90 people at each health system that transitioned from Digitally Excluded to Digitally Supported.*				

Table D5 simply applies the digital inclusion investment costs (Table D4) to the baseline number of patients in each digital readiness category at each institution (Table D2). The health system investment costs from Table D5 serve as the health system investment figures used in Table D1 to produce the ROI calculation.

Table D5. Digital inclusion investment by scenario

Scenario	Digitally Resilient	Digitally Supported	Digitally Excluded	Health-system total	Community total	Total DI investment
Affluent: +HS	$27,000	$40,000	$60,000	$127,000		$127,000
Affluent: HS+Comm	$27,000	$40,000	$60,000	$127,000	$52,200	$179,200
Public HS: +HS	$22,500	$20,000	$90,000	$132,500		$132,500
Public HS: HS+Com	$22,500	$20,000	$90,000	$132,500	$52,200	$184,700

Tables D6-8 look at health care utilization. Table D6 presents the expected annual number of high-acuity healthcare utilization events per 1,000 patients in each digital readiness category. These values are model inputs derived from literature documenting the association between sociodemographic factors between both health disparities and

digital exclusion/readiness. Users should replace these illustrative values with estimates appropriate to their own populations and settings.

The per patient event reduction represents the proportion of high-acuity events that would be avoided per patient if all individuals in a digital readiness category experienced events at the rate observed in the next higher digital readiness category. It is calculated by simply subtracting the event rate of one digital readiness level from the lower readiness level, e.g. 310 events per 1,000 Digitally Resilient patients from 820 Digitally Supported patients, divided by 1,000.

The model assumes that larger reductions occur when individuals move from D-S to D-R than from D-E to D-S. This reflects the premise that individuals who already possess basic digital skills and access can realize health benefits relatively quickly when they learn to use health-specific technologies such as patient portals, telehealth platforms, remote monitoring devices, and electronic communication tools. In contrast, individuals who are Digitally Excluded often require more substantial investments in access, skills, confidence, and ongoing support before comparable health benefits can be achieved.

Table D6. Expected high-acuity healthcare utilization events per 1,000 patients

Digital readiness group	ED visits	Hospital admissions	30-day readmissions	Total events	Per patient event reduction vs prior state
Digitally Resilient	250	50	10	310	0.51
Digitally Supported	650	150	20	820	
Digitally Excluded	800	200	40	1,040	0.22
Total	1,700	400	70	2,170	
Note: Event reduction is the expected number of high-acuity events per patient associated with moving to the next higher digital readiness category.					

Table D7 converts the event counts in Table D6 into the fraction of total high-acuity events represented by each event type within each digital readiness category. For each category, the number of events of a given type is divided by the total number of high-acuity events for that group. These fractions are then used to weight event costs by event type in Table D10.

Table D7. Event mix by readiness group

Digital readiness group	ED share	Admission share	Readmission share
Digitally Resilient	0.81	0.16	0.03
Digitally Supported	0.79	0.18	0.02
Digitally Excluded	0.77	0.19	0.04
Total	0.78	0.18	0.03

Table D8 combines the population distributions from Tables D2 and D3 with the utilization rates from Table D6 to estimate expected numbers of high-acuity healthcare events before and after health system and community support. Differences between the two estimates represent events potentially averted through improvements in digital readiness.

Table D8. Expected total high-acuity events by readiness distribution

Scenario	Digitally Resilient patients	Resilient events	Digitally Supported patients	Supported events	Digitally Excluded patients	Excluded events	Total events
Affluent: Baseline	600	186.0	200	164.0	200	208.0	558.0
Affluent: +HS	660	204.6	150	123.0	190	197.6	525.2
Affluent: HS+Comm	660	204.6	240	196.8	100	104.0	505.4
Public HS: Baseline	500	155.0	200	164.0	300	312.0	631.0
Public HS: +HS	530	164.3	170	139.4	300	312.0	615.7
Public HS: HS+Comm	530	164.3	260	213.2	210	218.4	595.9

Tables D9 and D10 show the financial impact of avoided events. Table D9 performs a number of intermediate calculations. The weighted baseline number of events in each readiness group comes from adding the number of events at each of the two institutions in Table D8. In Table 9, the estimated number of events per group comes from multiplying the baseline events) with the event mix estimates from Table D7. Estimates of the cost per event type were derived from published literature, to be updated with costs specific to a model user's institution. The total cost of all event types comes multiplying the per event costs and the total number of each event type across all digital readiness groups. The final weighted average cost per event comes from dividing the sum of the cost of all events by the total number of baseline events for all readiness groups.

Table D9. Weighted average cost per high-acuity event

Item	Resilient	Supported	Excluded
Baseline events by readiness group	341.0	328.0	520.0
Estimated ED events	275	260	400
Estimated admission events	55	60	100
Estimated readmission events	11	8	20
Cost input — ED cost per event			$1,500
Cost input — admission cost per event			$15,000
Cost input — readmission cost per event			$20,000
Total cost — ED			$1,402,500
Total cost — admissions			$3,225,000
Total cost — readmissions			$780,000
Final weighted average cost per event			$4,548

Finally, in Table D10, the averted event costs come from the product of the number of averted events and the weighted average cost per event in Table D9. The averted event costs contribute to the numerators (Table D1) for the ROI calculations. The number of averted events is the sum of the product of the event reduction fraction (D6) and the number transitioning from D-E to D-S and from D-S to D-R (D3).

Table D10. Averted events and costs by investment scenario

Scenario	Averted events	Averted event cost	Formula basis
Affluent: +HS	32.8	$149,172	Transition counts × readiness-specific event reductions
Affluent: HS+Community	52.6	$239,222	
Public HS: +HS	15.3	$69,583	
Public HS: HS+Community	35.1	$159,633	

Contact the author at amy@publichealthinnovators.com for a customizable, interactive MS Excel file with the model.