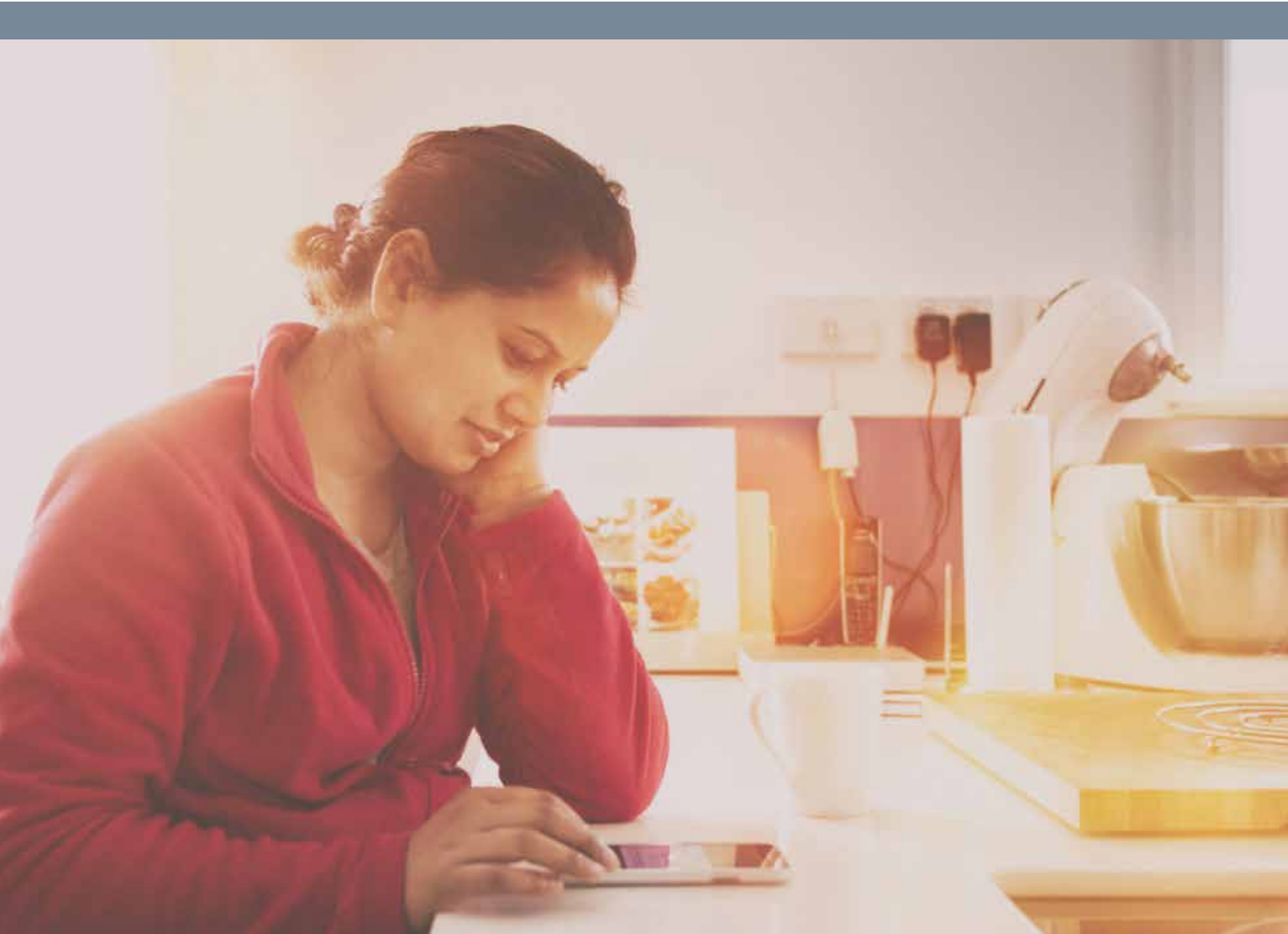




California Health Care Foundation



Digitizing the Safety Net: Health Tech Opportunities for the Underserved

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About the Author

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About the Foundation

The California Health Care Foundation is dedicated to advancing meaningful, measurable improvements in the way the health care delivery system provides care to the people of California, particularly those with low incomes and those whose needs are not well served by the status quo. We work to ensure that people have access to the care they need, when they need it, at a price they can afford.

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Juanita B., whose native language is Spanish, lives in Oakland, California. She is in the second trimester of pregnancy complicated by gestational diabetes. Each morning, she receives a text message prompting her to take her pre-natal vitamins. A second text reminds her that she has an appointment at La Clinica that day, and asks Juanita to confirm via text reply that she will be able to keep the appointment. She responds, “Si,” takes her vitamins, and makes breakfast based on a La Clinica recipe tailored for pregnant women with her condition.

Joe M. is a retired farmer in rural Montana, dealing with chronic heart failure. The 12-bed hospital in his community closed last year. The cable company that covers his area channels a telehealth program from a Billings medical center. Every morning, Joe steps on his Wi-Fi-enabled scale, and his weight is communicated to a care manager who tracks his health as part of a Medicare Advantage program for people with heart failure. If Joe gains more than a pound in a couple of days, the case manager phones him to make sure he is taking his diuretic as prescribed.

The programs that Juanita B. and Joe M. use are examples of a growing wave of digital innovations that are taking advantage of the move toward value-based payment under the Affordable Care Act (ACA) and the simultaneous drop in the cost of digital technologies. There is some urgency as millions of Americans, newly covered by insurance, seek care from institutions and providers already spread thin. This is especially true in the health care safety net, where urban and rural providers struggle to serve more patients whose needs are not necessarily met through the traditional 9-to-5 model.

Crucially, as the pressure on resources builds, the cost of digital technologies — particularly mobile phones — is falling. The result is a marketplace replete with opportunities for digital innovations that increase access and value. But for developers to succeed, they must offer products and programs that fit the needs of safety-net consumers in ways that are useful, accessible, and comfortable for them.

Safety-net populations, compared to all consumers, share a number of characteristics that impact their relationship to the health care system in terms of access, cost of

care, health status, and trust. Most importantly, they are at greater risk for chronic, preventable diseases. Some 90 million Americans have multiple chronic conditions (MCCs), with the prevalence of [MCCs highest among people with the lowest incomes](#).¹ Each additional chronic disease increases a person’s risk of adverse drug events, higher out-of-pocket expenses, impaired functional status, hospitalization, and mortality. Two-thirds of health spending is associated with patients managing MCCs.

Complex, high-cost patients often receive care at multiple sites from different providers. A lack of coordination, continuity, and uniform communication can result in greater downstream costs due to delayed care or later diagnosis. Research shows that socioeconomic and racial minorities [wait longer for care](#) than other populations.² Many do not have an ongoing relationship with a primary care provider (medical home). Nonelderly Medicaid patients use emergency departments (EDs) at higher rates than nonelderly privately insured patients. Some rely on frequent visits to the ED for primary and urgent care. [Among Medicaid enrollees with 10 or more ED visits](#) in a year, about half had weak ties to a regular physician.³

Importantly, low-income consumers are harder to reach and to serve in the traditional model of face-to-face care during typical working hours. They are more likely than others to lack stable housing, transportation, and work schedule flexibility. Many lack facility in English, and some are socially isolated. People in the safety-net population tend to have less consistent access to Wi-Fi, which is increasingly becoming a necessity for connecting with education, health, and human services.

Despite these problems, a significant portion of low-income consumers use digital technologies including mobile phones, and health care leaders are eager to take advantage of these digital capabilities. In a [global survey of health care leaders](#) working in the public and private sectors, reaching communities that have been inaccessible or underserved was named the top-most-promising role for mobile phone technology.⁴ Likewise, [The Commonwealth Fund’s survey](#) of 200 leaders at urban and rural health centers found that providers would like to more effectively engage patients for a range of purposes: chronic disease management, preventive care (e.g., screenings and immunizations), and wellness (e.g., nutrition and physical activity).⁵

Providers also noted that mobile phones offer considerable potential to effectively engage patients. Hannah Calhoun of Blue Ridge Labs concurs. “The mobile phone is the primary way many underserved people access the Internet when not at school or work,” she said. Blue Ridge is part of the Robin Hood Foundation, whose mission is to fight poverty in New York City. Blue Ridge finds digital solutions to help low-income consumers. “We see that people are infinitely more responsive to SMS [texting] versus phone calls or emails,” added Calhoun. Their text-based programs are an example of the trove of innovations that are springing up to connect with low-income consumers.

Solutions with Traction in Underserved Markets

Digital health technology has attracted significant investment from venture capitalists, topping \$4.3 billion in 2014 and **\$2.1 billion in the first half of 2015**.⁶ There is an expanding list of consumer-facing digital tools designed to engage people — including or especially low-income consumers — in managing their health care. Table 1 organizes examples of digital health technologies by features that have made them effective among underserved consumers. The categories often overlap in terms of functionality.

Table 1. Examples of Digital Health Solutions Serving Low-Income Consumers, by Notable Feature

DIGITAL HEALTH EXAMPLES	
Uses Texting	<ul style="list-style-type: none"> ▶ Sense Health ▶ Text4Baby
Customizes Language and Communication Style	<ul style="list-style-type: none"> ▶ Polyglot ▶ Care Message ▶ HealthCrowd ▶ SpeechMed/Taylannas
Delivers Health Info via Portals and Kiosks	<ul style="list-style-type: none"> ▶ Qcare ▶ Faith Based Initiative Health Kiosk (collaboration of Henry Ford Health System and Health Alliance Plan) ▶ KP HealthConnect Portal
Delivers Health Info via Video, Telephone, or Cable (“Telehealth”)	<ul style="list-style-type: none"> ▶ Polycom Telehealth Network (telehealth platform at Open Door Community Health Center) ▶ Project ECHO ▶ Direct Dermatology ▶ Vivre Health (collaboration of Cox Communications and the Cleveland Clinic)
Combines Medical and Social Services	<ul style="list-style-type: none"> ▶ Healthify ▶ HealthLeads ▶ PurpleBinder
Leverages a Trusted Human Being	<ul style="list-style-type: none"> ▶ Omada Health ▶ Iora Health
Collects Data Passively	<ul style="list-style-type: none"> ▶ Propeller Health ▶ Adhere Tech ▶ Proteus Digital Health

Uses Texting

MobileCommons by Upland sees great promise in texting: “Despite the diversity present in target populations for health care enrollment, they all share one important common denominator: Almost everyone has a mobile phone, and all mobile phones can send and receive text messages.” **Upland** has implemented text messaging programs for Enroll America, the New York City Department of Health and Mental Hygiene, and Access Health CT, among other groups.

Research from various sources confirms the prevalence of mobile technology among underserved populations. **One-half of low-income adults** owned a smartphone by the end of 2014.⁷ Some **84% of US adults** in low-income households (defined as those with annual incomes under \$30,000) had cellphones in 2014.⁸ Eight in 10 low-income people send or receive text messages using a cell phone as well as using the Internet or email at home. Strikingly, **nearly one-half of low-income adults use the Internet** or email mostly on a cell phone, compared with only 27% of people in the highest-income group (over \$75,000 household income).⁹ Such “cell-mostly Internet users” tend to be young adults, non-whites, less educated, and less affluent, **according to the Pew Research Center**.¹⁰

Eight in 10 low-income people send or receive text messages using a cell phone as well as using the Internet or email at home.

The adoption of mobile phone tools among safety-net providers has dramatically increased in recent years, noted Veenu Aulakh of the Center for Care Innovations. “Where people are starting from are simple transactions that add value right away, such as appointment reminders,” she said. “When clinics deploy this so people can cancel appointments, it pays for itself because providers can easily refill the slots. It is convenient for patients and reduces the need to do callbacks and reminders,” said Aulakh. “A win-win.”

Such customized text messaging bolstered appointment adherence by 40% and medication adherence by 12% at Montefiore Medical Center, which worked with **Sense Health**, a digital health communications company focused on supporting underserved patients. The

personalized text messaging program was combined with care managers in two-way messaging and care coordination, providing personal support to patients in the program. Based on the success of the Montefiore pilot, **Sense Health has expanded its role** in Medicaid care management programs in New York.

Of the handful of well-utilized health apps among the underserved, **Text4baby ranks high in sustained use**. It is coupled with a free mobile service designed to improve maternal and child health, a public health challenge for lower-income women. Launched in January 2010, Text4baby has had over 860,000 users — predominantly pregnant women and new mothers. Women who text BABY (or BEBE for Spanish) to 511411 receive three text messages a week, timed to their due date or their baby’s birthdate, through pregnancy and up until the baby’s first birthday.

The messages address labor signs and symptoms, birth-defect prevention, prenatal care, urgent alerts, developmental milestones, immunizations, nutrition, safe sleep, safety, and more. Research among pregnant women using the app versus other pregnant women found that Text4baby subscribers demonstrated a significantly higher level of health knowledge.

In 2012, **Text4baby partnered with CMS’s Connecting Kids to Coverage Initiative** to foster enrollment in Medicaid and the Children’s Health Insurance Program (CHIP) through interactive text messaging. The module kicked in three days after a new user enrolled in Text4baby, asking a question about the woman’s health insurance coverage. Nearly one-half of over 110,000 women who enrolled in Text4baby between late December 2012 and August 2013 responded to the first question, and some 13% of them reported they were uninsured. Many women sought out additional information about Medicaid and CHIP after receiving Text4baby’s messages about health coverage, and wanted to receive more text messages in the future.

HealthCrowd (see description, page 6) undertook a study that compared the relative cost-effectiveness of mobile messaging compared with other ways to connect with members of a Medicaid plan. They found that texting was the most cost-effective mode; costs ranged from \$34.59 for direct postal mail to less than \$1 for the mobile message — a 30-times return on investment for

messaging versus mail. Further, they found that members who responded more frequently to [HealthCrowd's text messages were more likely](#) to take the required action during the campaign period versus patients who responded less often.

Likewise, the Kaiser Commission on Medicaid and the Uninsured found that sending short, scheduled text messages before and during open enrollment for insurance under the ACA [increased the probability that uninsured people followed through](#) with enrollment.¹¹

Customizes Language and Communication Style

One solution that focuses on communicating with users in ways they understand is offered by **Polyglot Systems**, which targets community health center providers. Its tagline is “Health Through Understanding.” The company’s Meducation product translates medication and discharge instructions into 18 languages and offers visual instructions for patients who are visual learners. Polyglot’s founder, Sims Preston, believes that [the Affordable Care Act motivated dozens](#) of health care providers to adopt such products in the reimbursement shift from paying for volume to paying for value and better outcomes.

“Medicaid beneficiaries are busy people too, sometimes juggling multiple jobs. If they can’t tell from our message what’s in it for them, they will ignore it.”

HealthCrowd is a company that automates email, text, and telephone communications between Medicaid health plans and their members. Neng Bing Doh, CEO of HealthCrowd, spent most of her career in online advertising prior to health care. She recommends tailoring strategic communications to patients and consumers in ways they want to receive them. HealthCrowd’s platform and data analytics learn what mode and style of communication are most likely to lead plan members to respond and take action. “People involved in member communications need to keep asking ‘What’s in it for the members in this communication?’” Bing said. “This is even more important for Medicaid beneficiaries. They are busy people too, sometimes juggling multiple jobs. If

they can’t tell from our message what’s in it for them, they will ignore it,” she said.

HealthCrowd was tasked by a Medicaid health plan to help reduce voluntary disenrollment — a member lapsing after a few months of being enrolled. Through a personalized messaging campaign, HealthCrowd communicated with newer members to identify any complaints — for example, a bad experience during a physician visit. A simple text message would identify this problem, get the member “hot transferred” to a marketing representative, and resolve the problem.

Delivers Health Info via Portals and Kiosks

There is growing evidence that using patient portals and email communications can help to ameliorate health disparities and improve patients’ outcomes.

[Email messaging between patients and providers](#) can also bolster outcomes for patients managing chronic conditions like diabetes.¹² Between 2004 and 2010, Kaiser Permanente implemented **KP HealthConnect**, an electronic health record (EHR). In a retrospective study mining secure patient-physician email and Healthcare Effectiveness Data and Information Set (HEDIS) effectiveness-of-care measures for diabetes and hypertension, [Kaiser found](#) that electronic messaging along with implementation of the EHR contributed to reducing health disparities for black patients managing diabetes and heart disease.¹³

Kiosks can also have positive health impacts in underserved communities, especially “opportunistic kiosks” that push health information to people at times and places when they most seek it.

A [kiosk with a behavioral health mission](#) is located in a North Philadelphia grocery store. An estimated one in four Americans experiences a serious mental health problem in any given year, and 70% do not seek treatment. The kiosk system uses the tagline, “A check-up from the neck up.” It is not a substitute for human intervention, according to Joe Pyle, president of the Scattergood Foundation, which manages the kiosk along with officials from the city of Philadelphia. Locating the kiosk in a supermarket along with a retail clinic “begins to normalize mental health issues,” he said.

The retail clinic, **QCare**, was opened by the Family Practice and Counseling Network, a group of community health centers. Executive Director Donna Torrisi said, “I’m a firm believer that you can’t do primary care without behavioral health if you’re serving low-income people.”

Taking the approach that health is where we live, work, play, and pray, **Henry Ford Health System** launched the Faith Based Initiative Health Kiosk, collaborating with Detroit-area churches and the Health Alliance Plan to bolster health literacy in the hospital’s underserved neighborhoods. The kiosk serves as a diagnostic tool designed to assess the physical health of the user, and provides information on health promotion, diabetes, hypertension, heart disease, HIV/AIDS, obesity, and disease prevention. The kiosk also offers personalized healthy lifestyle suggestions and local community resources. The idea behind the initiative is to combine science and spirituality as people learn about their health.

Delivers Health Info via Video, Telephone, or Cable (“Telehealth”)

Telehealth [has long been deployed in underserved and rural areas](#) to extend both primary and specialty care to communities.¹⁴ It can be delivered by means of live video, store-and-forward technology, remote patient monitoring, and mobile health platforms like cell phones, tablets, PDAs, and other devices. The American Recovery and Reinvestment Act of 2009 (ARRA) earmarked \$7.2 billion to expand broadband infrastructure and services across the country, with priority given to initiatives that encourage development in underserved communities. [These investments in broadband](#) support the implementation of telehealth.¹⁵

Telehealth has been part of the **Open Door Community Health Centers** (ODCHC), a group of 10 FQHCs in California’s North Coast region, since pioneering the concept in the late 1990s. Through the Polycom telehealth network, ODCHC links safety-net patients with health care providers, including specialists and behavioral health clinicians, offering remote consultations and health education. [ODCHC has found that telehealth](#) services can bolster outcomes for patients trying to manage diabetes and other chronic conditions.

Project ECHO at the University of New Mexico Health Sciences Center was launched in 2003, focusing on treating hepatitis C via telecommunications technology. Since

then, the [program has globally expanded](#), and through its hub-and-spoke model, addresses over 40 health conditions. It enables primary care providers in rural and underserved areas to discuss a patient’s clinical care with specialists in large medical centers. ECHO, a non-profit and collaborative model of medical education and care management, stands for “Extension for Community Healthcare Outcomes.” In 2015, the [American Academy of Pediatrics joined](#) with Project ECHO to create a “superhub” to expand access for specialized pediatric care in underserved areas.¹⁶

Fast-growing areas for telehealth in underserved areas are dermatology and obstetrics, according to Julie Murchinson of the Health Evolution Summit. **Direct Dermatology** is a telemedicine company that provides remote dermatology consultations, expanding access to expert and affordable specialty care.¹⁷ The company has a significant reach into FQHCs, serving rural farmworkers and other patients lacking access to dermatologists. Dr. David Wong, cofounder of Direct Dermatology, believes that a social mission can underpin a for-profit company in health care. He was motivated to start Direct Dermatology after an encounter with a patient — a farmworker with a metastatic melanoma — who died a few months later. [Wong was struck](#) by the “marked difference in the access to care as well as the quality of care patients were receiving.”¹⁸

He was motivated to start Direct Dermatology after an encounter with a patient — a farmworker with a metastatic melanoma — who died a few months later.

As the market for telehealth services grows — buoyed by reimbursement from Medicaid and other insurers — cable television companies are getting involved. The industry has the advantage of a presence in consumers’ homes. **Cox Communications**, which had been a long-time provider of broadband internet access to hospitals, developed a strategic alliance with Cleveland Clinic to form Vivre Health. The venture will leverage Cox’s plan to deliver residential gigabit Internet speeds by the end of 2016. Via the fast cable connection, Vivre Health will enable digital home care, such as video consultations with post-discharge patients. Cox is also investing in

HealthSpot, a cloud-based platform featuring a walled kiosk equipped with medical sensors and digital devices.

Combines Medical and Social Services

Some entrepreneurs are looking to integrate medical care into a broader range of services. Following are some examples of solutions that combine clinical and social services.

Healthify is a platform that safety-net organizations can use to identify community-based services that bolster the social determinants of health, such as housing, food, education, jobs, and goods. Referrals for a client can be tracked and analyzed in a patient dashboard, and analytics can be applied for population health and community needs assessment. The Healthify platform can also integrate data from apps, devices, and community-based organizations. The company's clients include UnitedHealthcare and Johns Hopkins Healthcare, and Medicaid managed care plans in Maryland and New York, among others.

Health Leads works to help medical providers link to social services. It enables clinicians to "prescribe" goods and services that fall outside of traditional health care, such as food, heat, and employment. In-person advocates staff the clinics that Health Leads works with, helping patients "fill" the prescriptions through a comprehensive network of community resources. In 2014, Health Leads had 900 advocates working in seven cities, assisting more than 13,000 patients at Kaiser Permanente, Massachusetts General Hospital, Johns Hopkins, and other providers.

Also covering a broad portfolio of services beyond health care, **PurpleBinder** links patients to jobs, goods, food, legal services, financial services, child and senior care, education, housing, and transit. PurpleBinder works with health care providers and government agencies, researching needs in the community that are most responsible for health disparities. It matches people to community services and provides a feedback loop to the health systems and providers to track how many people received the services to which they were referred.

Leverages a Trusted Human Being

"If you tie a coach or human at the other end of a digital health intervention, it increases the likelihood of a user engaging for their own health," Stan Berkow of **Sense Health** has learned. He calls this paradigm "supportive accountability," a concept pioneered by Northwestern University researcher David Mohr.¹⁹

Sense Health's technology platform enables patients to collect their health information in one place and share the information as they choose. The product blends direct messaging between a health coach and patient with functionality to improve efficiency for the health coach. Testing found that the platform improves Medicaid patients' self-management and outcomes. Combining a technology solution with a care manager helped patients feel connected, versus simply being given a technology to use.

"If you tie a coach or human at the other end of a digital health intervention, it increases the likelihood of a user engaging for their own health."

Omada Health focuses on tackling chronic disease through prevention and social networking. Live coaching, complemented by technology and peer-to-peer social networks, is at the heart of Omada's Prevent program. Prevent is a 16-week health education and behavior change program targeting people at risk for type 2 diabetes. The course features content on food, exercise, mental health, and other issues that bolster health literacy, self-care, and self-efficacy. Users have a weekly interactive session via computer or mobile device, and also receive a pedometer and Wi-Fi scale to track progress. Omada Health has been working with health plans and self-insured employers, such as Costco, Iron Mountain, and Lowe's, the Department of Veterans Affairs, and with seniors in Medicare Advantage plans. The company is also targeting people enrolled in Medicaid and those cared for by safety-net providers, deploying a Spanish-language version of Prevent and evaluating use in low-income populations.

Iora Health is a comprehensive primary care model emphasizing team-based care. Each patient has a care team that includes a doctor, nurse, and health coach.

Founder Rushika Fernandopulle, writing in the [Health Affairs Blog](#), described how it works.²⁰ “Our teams now see their job as having a defined population who are their responsibility, and their role is to improve their health and keep them out of trouble (e.g., the hospital, emergency room, and unnecessary procedures).” The approach also bundles behavioral health into the process. The company has demonstrated better health outcomes for hypertension and diabetes control compared with traditional primary care, along with higher patient satisfaction scores. Iora Health practices receive a fixed fee per patient for all services. Patients have in-person visits with the care team and also have digital contact through email, text, group visits, home visits, or inpatient visits. Iora Health providers also consider barriers that patients may encounter as part of social determinants of health and may allocate dollars to housing and transportation when appropriate.

Collects Data Passively

Technologies that avoid the need for users to enter their own data in order to track and manage their health may be particularly valuable to consumers who have constraints in their work schedule, who are less fluent in English, or who have less consistent computer access.

Propeller Health offers devices that both track the use of inhaled medications for asthma and chronic obstructive pulmonary disease and also provide tailored information through mobile phones, web analytics, and personal services to patients, their families, and doctors.²¹ The data, captured and transmitted wirelessly, help physicians make informed clinical decisions and support patients in managing their conditions.

“In managing the health of a population, a tool like this could achieve real value for the provider and drive measurable health outcomes for the patient.”

Dignity Health, a nonprofit health system in California, worked with Propeller Health to study patients’ use of the technology for managing asthma.²² They enrolled almost 500 patients, approximately 25% of whom were determined to be underserved. Over the course of one

Another Kind of Mobile Health: Think Lyft and Uber

Across the nation, each year about 3.6 million people miss or delay health care because they don’t have transportation to health care appointments or cannot take time away from a job to see a doctor.

Welcome to the role of Lyft and Uber in health. In January 2016, [Lyft began offering patients rides](#) in New York City, where over half of households are car-free. Lyft partners with Medtrans Network, providing rides for non-emergency medical appointments through Lyft’s mobile platform. The program first focused on people over 65, about one-fourth of whom do not own a smartphone. So Lyft introduced Concierge, which enables a requester to ask for Lyft rides online, filling out a request form with the passenger’s name, pickup and drop-off location.

“Using transportation-as-a-service like this, the health plans and government agencies we partner with are significantly reducing fraud, saving costs, and improving the patient experience,” said Billy McKee, president of National Medtrans Network.

Uber, Lyft’s competitor, works with MedStar Health, a nonprofit health care system in Maryland and the Washington, DC, region. The [MedStarHealth.org](#) website features a [“Ride with Uber”](#) button that enables its patients to schedule a ride and appointment at one of 10 MedStar hospitals or hundreds of outpatient locations. At the start of the 2015 flu season, UberHEALTH provided transportation for registered nurses with Passport Health to travel around 35 US cities to deliver free flu shots with the purchase of a \$10 “wellness pack” (including a water bottle, tissues, hand sanitizer, lollipop, and UberHEALTH tote). Consumers who wanted to take advantage of the offer opened the Uber app on their mobile phones or tablets, and could opt to also request a flu vaccine.

Uber piloted the program in the 2014 flu season in Boston, Chicago, and New York, publishing the results in the [Annals of Internal Medicine](#).²³ Uber is working with Dr. John Brownstein, a Boston-based epidemiologist affiliated at Harvard Medical School, to expand the company’s platform for health applications.

year, the research found that using the device significantly improved asthma control and the users' quality of life. "We introduced a digital intervention that works in a health system by designing a process to identify if it was something that a real customer would pay for," said Richard Roth of Dignity Health. "In managing the health of a population, a tool like this could achieve real value for the provider and drive measurable health outcomes for the patient."

Medication adherence continues to be a chronic care management challenge for providers, prescription drug manufacturers, and patients themselves. [The problem costs the US health system \\$300 billion annually](#), and results in 125,000 deaths.²⁴ Josh Stein, founder of **AdhereTech**, comes from a medical family. "It would be real neat if there was a time on the med bottle that could tell [patients] when to take a pill," [Stein told the Financial Times](#). He started up AdhereTech, a smart pill bottle embedded with sensors and a wireless cellular network. As a patient uses the pill bottle, data are wirelessly communicated to AdhereTech computer servers, then analyzed in real time. If a dose is missed, AdhereTech sends alerts via automated phone call and text message, and lights and chimes on the bottle.

The system can also route information to a care team for immediate intervention. An important design aspect of the pill bottle is its cellular connectivity. The device does not need to use a Wi-Fi connection, which is relatively costly for low-income consumers. "We put cell phone technology in a bottle," said Stein.

The future of medication adherence will likely include so-called digitally enhanced therapeutics, such as that developed by **Proteus Digital Health**. The regimen couples an ingestible sensor embedded in a medication with an external patch worn by the patient. The patch receives a signal marking the time the medication is taken. The patch also records steps and heart rate, communicating via mobile app through Bluetooth. In January 2016, Proteus [announced its first health provider customer](#), Barton Health, focusing on improving medication adherence in patients with uncontrolled and comorbid hypertension.

Learning from What Works

Writing in the [Health Affairs Blog](#) in 2014, Joseph West of NextLevel Health Partners asserted that people who have been underserved by the health care system have also been underserved by digital health tools, and that many challenges have prevented digital health from realizing its potential for these populations.²⁵ NextLevel works with the state of Illinois to provide care for people under the poverty line eligible for Medicaid. West believes that "significant health equity objectives can be achieved through the development of innovative interventions and care models that use mobile and wireless devices, such as smartphones, Bluetooth-enabled monitoring devices, tablets, and cloud-based software applications."

Following are some strategies for overcoming barriers to effectively serving low-income people.

Meet people where they are. Too many digital health interventions and programs — including many personal health records — are designed in ways that may [not be appropriate for underserved populations](#), particularly those with low literacy, low health literacy, or limited technology skills.²⁶ Blue Ridge Labs' Hannah Calhoun asserted that building a useful product requires "understanding the population you're working with . . . not only the person's technical proficiency and what hardware they're using, but what [phone service] payment plans they are on and their behaviors in how they interact with their phone or a computer." She added, "Do not assume, for example, that people universally have access to Wi-Fi, or that their cell phone number remains the same throughout the year."

"Do not assume that people universally have access to Wi-Fi, or that their cell phone number remains the same throughout the year."

The app Healthvana enables users to locate laboratories for STD testing via a phone's GPS. Ramin Bastani, founder of Healthvana, noted that many people who do not have an ongoing relationship with a health provider have downloaded the app. "Many of our users are

in health care underserved geographic areas. We were concerned that these patients wouldn't be able to access their test results due to a digital divide. This proved untrue. One woman using Healthvana went to a public library computer to check her results on Healthvana, then she clicked on the clinic locator, which showed her where to get treatment in her community."

Build trust. Demonstrate a consistent, high level of customer service. "If you give people a consistent user experience, and you follow through when you promise something, you build trust," Calhoon has learned. "If I say I am going to get you a monthly MetroCard, and it will show up three days before you need it so you don't miss service, I build trust." If, on the other hand, "that card shows up late, or people are double-billed, they won't stick with the service."

Trusted surrogates such as faith leaders, elected officials, local personalities, doctors, and educators can be valuable messengers. Jose Plaza, national director of Latino engagement at [Enroll America](#), found that some of the most trusted marketing channels have been churches, schools, libraries, and hospitals, which are free, accessible, frequent touch points for people in their local communities.²⁷ Here, in-person assistance and navigation was offered to prospective insurance plan enrollees. Similarly, the Be Covered Illinois program bolstered its insurance sign-up efforts by partnering with a broad range of community organizations, including the faith community, healthy food organizations, and ethnic health coalitions.

Address the social determinants of health. Health care services contribute a fraction to peoples' overall health and well-being; access to food, education, housing, and other factors bolster health as well. But [only 5% of low-income working families with children receive](#) the full package of benefits for which they qualify, such as Supplemental Nutrition Assistance Program (SNAP), child care, and Medicaid.²⁸ Shawn Nason of Xavier University spent months driving around the state of Mississippi doing research with underserved populations. "It's not always about health," he has learned. "It's about 'Help me meet my basic needs . . . don't talk to me about walking 10,000 steps a day when I'm a single mom with four kids, working two jobs.' So how do we as an industry meet consumers where they are?" Nason said. Ken Covinsky, a clinician researcher in UCSF's Division of Geriatrics, agrees that the basics must come first. "People don't necessarily need

someone to know when they open the fridge," he said. "They need someone to make or deliver a good meal."

Consider the cost of data service. While a growing percentage of low-income consumers own smartphones, a large portion of them use the devices like basic phones, Vineet Singal of CareMessage said. Data plans are expensive for underserved populations. Singal observed that a health care provider accepting value-based reimbursement could find it financially viable to subsidize some or all of an enrollee's phone data service when supporting a population health issue such as diabetes or heart disease. Averting a single hospital stay for that patient would easily pay for the annual data charges.

Recognize the many layers of health literacy. "Too few people actually understand medical information well enough improve their health," [cautioned a JAMA article](#) on the challenge of health literacy.²⁹ "Only 12% of US adults had a proficient state of health literacy whereby individuals can obtain, process, and understand the basic health information and services they need to make appropriate health decisions." Beyond general education literacy, there are several layers to health literacy: competence in using digital technology (such as shopping for health insurance online), navigating health plans, comprehending lab test results delivered on a patient portal, and understanding health care financing concepts such as copayments, co-insurance, and deductibles.

People for whom English is a second language have additional health literacy burdens. Susan Perry, CEO of Taylannas, developed SpeechMed to help remedy this problem. "We give people information in the language they understand that will help them be adherent to medical instructions," she said. Her team is working with South Miami Hospital to develop technology for inpatients to improve their understanding of discharge information as well as aftercare, including medication management. The technology allows patients to take a picture of their medications to avoid prescription drug errors.

Speak in the vernacular. CareMessage has developed content in both English and Spanish, with translations done by native Spanish speakers, Vineet Singal explained. "Oftentimes in health care, we unintentionally are paternalistic in the language we use. When thinking of behavior change, this can come across as a little bit like a parent or Big Brother. Patients don't want to feel coerced. We want to be persuasive, leveraging peoples'

own motivations for change to help them make better decisions for health,” Singal said. The learning is to speak in the cultural vernacular that consumers understand.

Taylannas’s Susan Perry emphasized this point after she observed someone speaking in a mix of English and Spanish (“Spanglish”) who was told in a written prescription to take medications “once.” The patient interpreted this to mean 11 pills (*once* means “11” in Spanish). The company Polyglot has successfully worked with pictograms and graphics to address such literacy and vernacular challenges in health care.

Mikki Nasch of Evidation Health agrees that the message has to be just right. She offered the example of high-risk pregnancies, a very expensive category in Medicaid. “Outcomes can improve through texting the mother-to-be, updating her on what she should know,” said Nasch. “Unintentional harm can be averted when there is enough information passed to those individuals.”

The program was redesigned to text mothers in the voice of their babies. “This threw a switch. All of a sudden, success rates were incredible.”

Nasch described a governmental program in Pakistan that failed when it was first implemented because it “spoke” to women via text from the government’s “voice.” The program was redesigned to speak to mothers in the voice of their babies. “This threw a switch. All of a sudden, success rates were incredible,” Nasch explained. “We must deal with the inability to communicate with a group we fundamentally don’t know how to communicate with.”

The Safety Net as Launching Ground

The safety net, under the new value-based payment environment, can be a valuable launching ground to prove the worth of quality-enhancing, cost-reducing technologies. “The margins are going to be lower,” acknowledged Ed Manicka of Corventis. “But the pure scale is mind-boggling.” Andrey Ostrovsky of Care at Hand is also enthusiastic. “We are moving toward a very interesting time in digital health where there’s a lot of opportunity

to fix really big problems. I think the most money is to be made in the places where the largest social inequities exist,” he added.

Still, Aman Bhandari of Merck cautions against the attraction to inventing shiny new things. “There’s no adrenaline rush from doing the things that we know work,” he said. “If we spent all our time trying to scale things we know work, maybe we’d be in a different place.” He believes that “the new sexy is scaling what can work.” For example, he posited, “What if Google worked with the American Public Health Association? There are powerful lessons to learn in digital health communications from public health campaigns.”

“The new sexy is scaling what can work.”

Other combinations easily come to mind. What if cable television companies like Univision partnered with a Texas safety-net hospital to channel remote health monitoring and entertaining content to Spanish-speaking people managing type 2 diabetes?

Or what if grocery store kiosks like *higi* worked with Anthem health plan to gamify healthy eating challenges, recipe sharing, and mobile apps for social networking about chronic health conditions and food?³⁰

The possibilities are endless. What we know is that it will take a mashup of *digital plus analog*, imaginative new collaborations that focus tightly on users’ needs and vernacular.

And it will require a value-based payment paradigm to scale the kind of innovation in digital health that the underserved need and want. In fact, value-based payment underpins many health centers’ adoption of digital health technology, asserted Veenu Aulakh of the Center for Care Innovations, pointing to online appointment scheduling and the use of video visits for high-cost patients at home. She envisions that “digital health solutions will take off more when the shackles of fee-for-service are removed.”

The sooner Medicaid and other plans that cover low-income Americans move to paying for value, the sooner the underserved can be better served by promising digital health technologies.

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