SPECIAL REPORT:

State of Health

PATRICK DUNN | MONDAY, MAY 20, 2019

How technology is bridging gaps between healthcare and underserved populations
This article is part of State of Health, a series examining health disparities, how they affect Michigan's children and seniors, and the innovative solutions being developed to address them. It is made possible with funding from the Michigan Health Endowment Fund.

When Steven Ondersma began his career as a clinical psychologist, he was excited to start changing the world with what he'd learned in school. But he says he quickly realized that "only a very small proportion, maybe 10%," of the people who need professional care realize that need and have the means to address it.

"I've just become really interested in having whole-population effects, rather than helping a few people who might be ready to make use of the treatment and have access to that treatment," says Ondersma, deputy director of the Merrill Palmer Skillman Institute at Wayne State University. "I really want to make a difference that could potentially be measurable on a societal level, and to do that I think you actually have to start with, 'Okay, how can I reach large numbers of people?'"
Ondersma and others in Michigan who are interested in addressing the social determinants of health have increasingly turned to technology as an answer to that question. The percentage of the U.S. GDP that Americans spend on healthcare has nearly tripled since 1980, vastly outpacing other countries. Americans now spend $10,224 per capita on healthcare annually, nearly twice as much as other countries of similar size and wealth.

Healthcare is expensive – prohibitively so for low-income Americans. But while that picture has only worsened with time, there are encouraging signs for Americans’ access to the internet and associated implications for health. While only 45% of U.S. adults making under $30,000 are home broadband users, 92% of them have a cellphone (and 67% have a smartphone).

"It’s becoming nothing like a luxury, but really a critical way to keep in touch with your support system, to access services, to know what is happening around you, to interact with teachers," Ondersma says. "It’s just become a necessity."
It also provides a low-cost, easily replicable way to connect underserved populations to healthcare. And it’s only one example of how the developing field known to some as e-health offers new possibilities for reducing health disparities. Another major opportunity is telemedicine, which allows patients to connect with practitioners through videoconferencing or other technology. The number of U.S. hospitals that use telemedicine technology has more than doubled since 2010 to 76%, allowing their practitioners to reach more rural patients and others who may face transportation-related barriers to care.

Weisong Shi, a professor of computer science at Wayne State University and editor-in-chief of the journal *Smart Health*, envisions the potential for technology to bring a doctor’s office to those more remote patients. He proposes a vehicle, "just like an ice cream truck," that would allow people to get basic physical tests in their communities, with the results being transmitted back to a provider’s office.

"You can go to this rural area and ... run these checks without asking these people to drive about 50 miles away to go to a hospital to do this kind of test," Shi says. "I think technology has to be the only solution eventually for these lower-income places."
Technology is not the solution in and of itself for wealth inequality, racial injustice, or the many other systemic factors that create health disparities in Michigan. But it does have wide-ranging potential to provide support for those who suffer from those disparities. Here are four examples of how technology is helping to connect some of Michigan's most vulnerable populations to better health.

**Breaking down the stigma of behavioral health**

Mental health issues often go alarmingly unaddressed for Michigan kids, and that problem is only worse in the many low-income and/or rural southeastern Michigan communities served by the Family Medical Center of Michigan (FMC). The nonprofit, federally qualified health center serves Monroe, Lenawee, and Wayne counties. In a 2016 project funded by the Michigan Health Endowment Fund (MHEF), FMC worked with six different school districts to establish behavioral health clinics including telepsychiatry programs for students.

![A webcam and monitor used by FMC for psychiatrist web conferences.](image-url)
Students could see an FMC child psychiatrist at school via web conference, facilitated by a social worker on site at the school. FMC chief operating officer Audrey Smith says the program was inspired in part by the defunding of social work services in schools, as well as by the fact that FMC already had experience with telemedicine technology.

"We do have a child psychiatrist, and we said, 'Hmm. How about we utilize the telepsychiatry technology to be able to bring our psychiatrist work to rural communities?' she says.

FMC staff targeted schools with high free or reduced lunch populations, offering services where they were needed most.

"We're talking about (lack of) access to proper housing, proper food, proper transportation, economics, jobs," Smith says. "All of those issues play a part in the schools that we're in."

In many cases those social determinants of health might completely inhibit a child from getting behavioral health care. Smith says that in many of the communities FMC works with, the wait to see a psychiatrist averages around three months. Even then, the psychiatrist's office may be prohibitively far away for a low-income family lacking access to transportation.

"What we're able to do is cut that timeframe down, and then certainly bring the psychiatrist to the school, so then we're not having issues of transportation being a barrier," Smith says.
The program has drawn positive feedback from students, parents, and school staff, and it's expanded into two more school districts, including Detroit, since it got started. FMC is currently planning to expand web-based behavioral health even further in those schools by introducing a program called Tickit, which allows students to complete a self-assessment that screens for depression, substance abuse, and suicidal behavior.

Most importantly, Smith says the behavioral health clinics have helped to break down the stigma that surrounds mental health.

"Other students in a school ... know when a child is going through something," she says. "And they will say, 'Oh, I've seen (the psychiatrist,) Mrs. Meredith. Oh, Mrs. Meredith is my friend. We're seeing her.' And it's interesting, because they're not shying away from having seen Mrs. Meredith."

Reducing asthma emergencies
Asthma disproportionately affects African-Americans nationwide, but in Detroit the problem is particularly pronounced – and often an emergency situation. In 2016 the Michigan Department of Health and Human Services found that the prevalence of asthma in predominantly black Detroit was 29% higher than in the rest of Michigan, and that white Detroiters saw 35% less hospitalizations for asthma than black Detroiters.

That’s due to a variety of factors. Some are genetic, but others include pollution from oil and gas facilities in highly industrialized Detroit, as well as limited access to adequate healthcare before an asthma attack becomes an emergency.

Karen MacDonell, an associate professor in the Wayne State University School of Medicine, has been using technology to improve those outcomes with the Detroit Young Adult Asthma Project. Funded by a series of National Institutes of Health grants, MacDonell began the project over 10 years ago by interviewing young African-American Detroiters about their asthma. She asked participants what strategies would help them adhere to their medication before an emergency arose.

"Long story short, they wanted something using technology – something they could have with them, something easy to manage, something brief," she says.
MacDonell developed a text messaging program that collects information about a patient's asthma and then sends the patient conversational messages encouraging medication use.

"Because this age group uses technology so routinely in their lives, they don't mind getting text messages," MacDonell says. "In fact, almost 100% report when they're finished (with the trial) that they'd like to continue receiving them."

The project also leverages the Computerized Intervention Authoring System (CIAS) to give patients motivational interventions via computer. Oondersma developed CIAS over a decade ago and has primarily used it in clinical settings to screen pregnant and postpartum women for drug use, but it has since been adapted to a variety of other settings.
MacDonell has found that patients take their medications more regularly after participating in the program. She says she frequently hears that participants weren't even aware of how often they were having asthma symptoms.

"Most of our participants have pretty severe asthma," she says. "Most of them were under a year (old) when they were diagnosed. For them that's just routine ... to have wheezing or coughing every day. They learn to live with it."

MacDonell has cast a wide net in finding participants for the program – including recruiting from emergency rooms, where young black asthma patients often make their only contact with professional care. She's currently in the midst of recruiting 200 participants for a clinical trial, and she expresses hope that the program may eventually grow in multiple ways. She envisions implementing the system in clinics and emergency rooms, possibly in app form, and eventually using it to connect users to primary care or low-cost medication.
"Ultimately, what I'd like to see is that we've developed a menu of technology-based asthma interventions that could be utilized in any combination by people as they're needed," MacDonell says. "I'd like to see it as widely available as possible."

**Remote recovery**

Lisa McLaughlin and Robin McIntosh were both deep in their own recovery processes when they met at an Alcoholics Anonymous meeting in 2009, but they were already thinking about how to improve recovery for others.

Both McLaughlin and McIntosh were staggered by statistics from the National Survey on Drug Use and Health. In 2017 the survey found that over 20 million Americans needed treatment for a substance use disorder, but only 4 million actually got it.

"We said, ... 'What is going on? What is broken? Why is it so hard to get treatment?" McIntosh says.

One of the biggest barriers they identified is that treatment is still an expensive proposition that often requires patients to travel long distances to a brick-and-mortar location.

"The cost adds up, and you're asking one of our most vulnerable populations in the United States to foot (the bill for) one of the most expensive, costly healthcare interventions," McIntosh says. "There's like an inversion there."

So the two women launched Workit Health, an online platform for addiction recovery, in 2015. Depending on their addictions, users may receive online therapy, coaching, or classes in conjunction with medication-assisted treatment. Costs are calculated on a sliding scale, and McLaughlin says they can be as low as one-tenth the cost of a traditional recovery program.
Robin McIntosh and Lisa McLaughlin.

That’s due mostly to Workit’s low overhead. The company maintains small offices in Ann Arbor (McLaughlin’s hometown) and San Francisco (where McIntosh is based, and where the two founders met). Patients must make an initial in-person visit to start their treatment, but after that they can check in with a clinician on an as-needed basis online.

McIntosh says the platform has been most popular with users at extreme ends of the socioeconomic scale. High-income users appreciate the system for the privacy it affords them, but low-income users have also flocked to it because of its affordability.

McLaughlin and McIntosh have noted distinct differences in the challenges associated with rolling Workit out in their two locations. McLaughlin says she originally wanted to establish a Michigan office because she knew over 40 people under 40 years old who'd passed away due to addiction-related reasons here, "and that's not what I saw in San Francisco."
Today, she and McIntosh still note a variety of disadvantages to the way Michigan handles addiction treatment, including more regulatory hurdles, less available grant funding, and more community resistance to unconventional treatment approaches.

However, they've also seen patients drive as long as 11 hours to make their initial visit to Workit’s Ann Arbor office. McLaughlin says that shows her Workit is making a significant difference for patients whose previous options were "either continue using or die."

"We hear (patients say), 'Oh, I believe this is possible now. I can see a path forward where I couldn’t before,’" she says. "That’s huge. That’s going to be game-changing for rates of overdose in the state."

Health information for the incarcerated
In 2009 the federal government set aside billions of dollars to help healthcare providers create electronic health records (EHRs) and online health information exchanges (HIEs) to share them. However, correctional facilities have largely been left out of that industry leap forward, due in part to a lack of funds to support implementation of the necessary technology.

But in Washtenaw County, the Correctional Care Integration Project (CCIP) has successfully established an HIE for the Washtenaw County Jail and the Washtenaw County Youth Center (the county's juvenile detention facility).

The CCIP is a partnership between Washtenaw County Community Mental Health, the nonprofit Altarum, the Michigan HIE Great Lakes Connect, and Correct Care Solutions, a healthcare provider for corrections systems. With a grant from MHEF, the organizations implemented new technology and workflows allowing for inmates' EHRs to be created, stored, and exchanged between the correctional facilities and other healthcare providers.

Christy Avery, who served as Altarum's project manager for the CCIP, says that's a massive improvement from the way things worked before. To get a patient's medical records, she says, "you either had to make a phone call or you had to send a fax or you had to send something in the mail and then you had to hope that somebody was going to respond and get back to you. There was not a lot of real-time information sharing happening."
That made it difficult and often impossible for physicians in the facilities to determine patients' medical histories or what medications they should be on. Avery says the HIE "opened up this whole new world" when it launched in 2017, yielding numerous success stories for patients. Avery recalls one story of a patient in the jail who was vomiting blood.

"The first thought was maybe he had a bleeding ulcer, which is a normal thought," she says. "Maybe you just throw some medication at him, but they were able to pull up a CAT scan that showed that he had a suspicious mass. If they hadn't been able to access those test results immediately, his treatment would have been delayed."

Projects that involve significant workflow changes often encounter resistance, but Avery says the CCIP was a unique case in that all involved parties were "really energetic and interested and understood immediately what the impact could be." Washtenaw County's correctional facilities now have an HIE for the long term, but Avery notes that countless other facilities across the state and the country still don't.

Christy Avery.
"The big takeaway is they need access to this information for better coordination of care," she says. "There is a potential solution and I hope we can continue to look towards moving in that direction."

**The future of e-health**

The potential benefits of e-health are hard to argue with. In Ondersma’s work with computerized interventions for pregnant and postpartum women, he says multiple studies have shown that women who received the intervention were twice as likely to abstain from drug, alcohol, and/or tobacco use.

However, he says, "we don’t want this to be all that they get. We just want it to be the first thing that they get."

Ondersma emphasizes that e-health is just one part of the bigger picture of improving health outcomes for underserved populations. But its potential is significant.

"We know enough to know that we should continue," he says. "... Our results are good enough that it merits further study and trying to do things to make the effects stronger."

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**Infographic by Jermaine Dickerson.**

**Christy Avery, Sarah Hawley, Lisa McLaughlin, and Ken Resnicow photos by Doug Coombe.**

**Karen MacDonell, Steven Ondersma, Weisong Shi, and Audrey Smith photos by Nick Hagen.**

**E-health, tailored to you**

The University of Michigan Center for Health Communications Research (CHCR) has created numerous specialized interventions to improve health outcomes for a wide range of populations over its 20-year history. As the center’s work has increasingly focused on technology-based interventions, it’s become vitally important to tailor those interventions as closely as possible to users’ specific needs and identities. CHCR co-director Sarah Hawley and senior leader Ken Resnicow chatted with us about the importance of tailoring in e-health.
Why is tailoring so important to the work you do?

Sarah Hawley: Any time you make something feel more personal to somebody, it feels like it has taken their own situation, attitudes, beliefs, and clinical factors into account in giving them back something that they can then use in their own life to improve their health. Those kinds of things really make the intervention feel much more salient and relevant and engaging, and therefore ideally have a bigger impact.

Ken Resnicow: Rather than just providing the usual fear, facts, and feedback, which are three common strategies to deliver health content, we tailor to your psychological attributes – such as whether or not you have a certain racial or ethnic identity, or whether or not you have certain belief systems.

What are some of those specific characteristics that would be most important for you to tailor to when you're working on an intervention that's attempting to address health disparities?

Ken Resnicow: It's a very complicated issue. Mentioning disparities is the most logical thing you would do in a disparity intervention. But it turns out our research suggested it depends on whether or not you have a certain ethnic identity type. Not all ethnic identity types want to hear that (they face a health disparity). The tailoring has to understand what is the role of race in your overall identity. Depending on how you answer that, then we would either use race as a motivating factor or ignore it and deemphasize it.

How do you go about determining which characteristics are most relevant to tailoring a specific intervention?

Ken Resnicow: It's a huge challenge. There's a couple of ways we try to do it. The empirical ways would include an actual quantitative survey. Let's say we want to get someone to quit smoking or lose weight, and we would in that questionnaire measure various characteristics like ethnic identity, your desire for directive versus autonomy-supportive messages, perhaps your family history. And we would analyze the data to see how important those factors are in terms of how they correlate in effect with the behavior of interest.

The gold standard would be to run a pilot study to see if, in fact, you get a stronger response when you tailor than when you don't tailor it. Those are pretty expensive and elaborate. We don't usually have that luxury. We usually build the tailoring decision out of smaller pieces than that.

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