

Life Sciences Practice

# The health benefits and business potential of digital therapeutics

Digital-native start-ups and healthcare incumbents can both play important roles in building and scaling digital therapeutics to improve the management of chronic health conditions.

*by Chirag Adatia, Ralf Dreischmeier, Samarth Shah, and Kirtika Sharma*



© 10'000 Hours/Getty Images

**Around the world**, the burden of chronic disease is increasing at a rapid pace. Unfortunately, most of these conditions are irreversible and need to be managed through lifelong medication use. However, many patients struggle with adhering to prescribed medications and implementing the behavioral and lifestyle changes that are needed to manage their diseases and stabilize their conditions. Often, physicians and other healthcare providers have little ability to monitor the extent to which patients are following their recommendations and maintaining treatment regimens. As a result, disease burdens at a population level are higher than they should be.

These challenges have created a need for comprehensive disease management solutions that are best enabled by digital technologies. In 2021, global digital health funding grew 79 percent over the previous year to reach \$57.2 billion.<sup>1</sup> Much attention and funding have flowed toward digital therapeutics, which can include multiple points of intervention

along the patient journey, including monitoring, medication adherence, behavioral engagement, personalized coaching, and real-time custom health recommendations. Within digital health, funding for digital therapeutics (including solutions for mental health) has grown at an even faster pace—up 134 percent from the prior year to reach \$8.9 billion in 2021.<sup>2</sup>

The impact potential here is significant, both in terms of clinical outcomes and economic benefits for stakeholders and societies. For example, research has shown that digital disease management can drive a 45 percent reduction in the three-month rate of major adverse cardiovascular events (MACEs) and a 50 percent reduction in the 30-day readmission rates for patients after acute myocardial infarction (AMI).<sup>3</sup> Similarly, it can help lower hemoglobin A1c (HbA1c) levels by one percentage point among patients with type 2 diabetes.<sup>4</sup> These data points illustrate the extent to which digital disease

**Research has shown that digital disease management can drive a 45 percent reduction in the three-month rate of major adverse cardiovascular events (MACEs) and a 50 percent reduction in the 30-day readmission rates for patients.**

---

<sup>1</sup> *State of digital health 2021 report*, CB Insights, January 20, 2022.

<sup>2</sup> Heather Landi, "Global digital health funding skyrockets to \$57.2B with record cash for mental health, telehealth," Fierce Healthcare, January 21, 2022.

<sup>3</sup> Jerilyn K. Allen et al., "Digital health intervention in acute myocardial infarction," *Circulation: Cardiovascular Quality and Outcomes*, July 15, 2021, Volume 14, Issue 7; Pawel Buszman et al., "Managed care after acute myocardial infarction (MC-AMI) reduces total mortality in 12-month follow-up—results from Poland's National Health Fund Program of Comprehensive Post-MI Care—A population-wide analysis," *Journal of Clinical Medicine*, 2020, Volume 9, Issue 10.

<sup>4</sup> Marcy K. Abner et al., "A novel intervention including individualized nutritional recommendations reduces hemoglobin A1c level, medication use, and weight in type 2 diabetes," *JMIR Diabetes*, 2017, Volume 2, Issue 1.

management can help save lives while also keeping patients healthier, which reduces costs for many stakeholders, including the patients themselves.

Many players are trying to disrupt the disease management space and develop new innovative models to manage chronic diseases. New-age start-ups bring radical, unconstrained perspectives, while incumbents contribute a much more detailed understanding of the challenges and various stakeholders. Ultimately, both start-ups and incumbents have critical roles to play in disrupting the space and scaling up solutions.

### Digital therapeutics can play an important role in chronic-disease management

The burden of chronic diseases has been increasing globally and is expected to continue. Chronic diseases (such as cardiovascular disease, cancer,

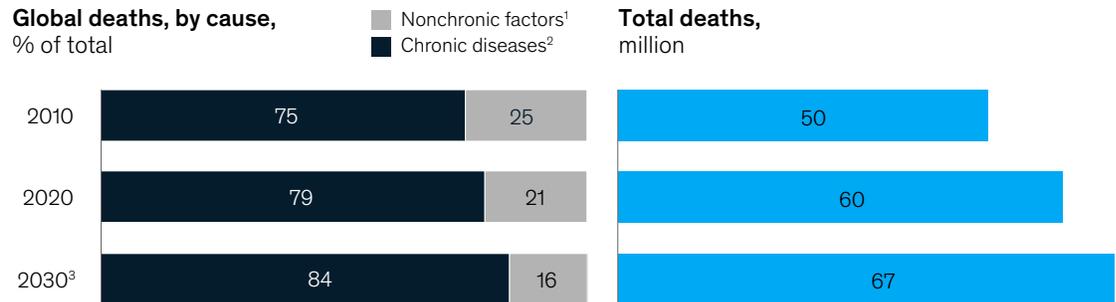
diabetes, and respiratory disease) were causes or contributing factors in 75 percent of worldwide deaths in 2010 and 79 percent in 2020. By 2030, experts predict that chronic diseases will contribute to as much as 84 percent of total global mortality (exhibit).

Poor monitoring of and adherence to prescribed medications undermine the management of chronic diseases. According to a 2021 global study, compliance among patients with type 2 diabetes ranges from 69 to 79 percent.<sup>5</sup>

Of course, chronic diseases need to be managed not only by medication but also with regular monitoring and lifestyle changes. Hence, providers need better end-to-end solutions that proactively and comprehensively monitor patient health, as well as encourage behavioral changes to improve adherence to prescribed medications, diet, and lifestyles.

Exhibit

### The burden of chronic diseases has been increasing globally and is expected to continue.



<sup>1</sup>Includes respiratory infections, road injuries, and tuberculosis.

<sup>2</sup>Includes cancers, cardiovascular diseases, dementia, diabetes, kidney diseases, liver diseases, and respiratory diseases.

<sup>3</sup>Estimated.

Source: Global Burden of Disease, IHME, Dec 2022

McKinsey & Company

<sup>5</sup> Diagnosis-related groups (DRG) treatment data: compliance (medication possession ratio) among patients with type 2 diabetes ranges between 69 to 79 percent for top-20 type 2 diabetes drugs; compliance rates for cancers according to a study on 52,450 patients was 37 percent. Patients were found to be most compliant in the 50- to 59-year-old range (49 percent compliant), with decreased compliance at the extremes of age. See Joseph Blansfield et al., "Analyzing the impact of compliance with national guidelines for pancreatic cancer care using the National Cancer Database," *Journal of Gastrointestinal Surgery*, August 2018, Volume 22, Issue 8; Nathan Levitan, "Industry Voices—Here's how AI is impacting the delivery of cancer care right now," *Fierce Healthcare*, June 28, 2019.

Digital technologies can play an important role in improving disease management by tackling these challenges. The potential for digital therapeutics to have a big impact is evidenced by the fact that almost two-thirds of the global population now has internet access.

Research has shown that digital solutions for disease management can drive better outcomes for patients living with chronic diseases. Examples include the following:

- A study of ten thousand patients by the Poland National Health Fund showed a 45 percent reduction in three-month MACE rate and a 40 percent reduction in 12-month mortality rate achieved through managed care after AMI. The study involved cardiac rehabilitation with physician guidance, counseling sessions on lifestyle modification, education on the associated risk factors, therapy, and in-person relaxation sessions.<sup>6</sup>
- A study by the Mayo Clinic in partnership with Healium showed a reduction in three-month rehospitalizations and emergency department visits of 40 percent for patients following AMI, a weight reduction of 4.0 kilograms, and a 10.8-millimeter reduction in systolic blood pressure. The study involved tracking of vitals, diet, and physical activity, setting reminders and goals, information on current health status, and educational courses for patients.<sup>7</sup>
- A US study of more than one thousand patients by Johns Hopkins and Corrie Health showed a 50 percent reduction in the 30-day readmission rate in patients following AMI attained through digital-health-based interventions. The study involved continuous monitoring of vitals with the help of connected devices; educational content on procedures, risk factors, and lifestyle modifications; medication management through reminders and tracking adherence; connection with the care team; mood tracking; and the ability to check the side effects of medication.<sup>8</sup>

- A one percentage-point reduction in HbA1c levels was shown in patients with type 2 diabetes who participated in an online patient community as part of Virta Health's ten-week nonrandomized parallel arm study with 262 outpatients. The patients were given individualized nutritional recommendations through dedicated health coaches, continuous glucose monitoring kits, and online counseling with doctors.<sup>9</sup>

### **Eight key elements of impactful digital therapeutics solutions**

Strong digital therapeutics solutions typically contain most or all of the following eight elements:

- **Regular monitoring, measurement, and feedback through connected medical devices.** Devices such as smart inhalers for respiratory conditions or continuous glucose monitors for diabetes can provide patients with nudges and alerts for out-of-range readings. For example, Boston-based Biofourmis applies digital therapeutics through the continuous monitoring of connected medical devices. The company offers a doctor-prescribed digital platform approved by the US Food and Drug Administration for patients suffering from chronic heart conditions. Its unique wearable devices offer specialty chronic heart care management, including automated medication management combined with a multidisciplinary remote clinical-care team. In 2022, the company was valued at \$1.3 billion.
- **Keeping payers and providers in the loop.** When patients grant access to their vital statistics, insurance companies, caregivers, and employers can reward them for progress in stabilizing or improving chronic health conditions. For example, Livongo, a program from Teladoc Health, allows patients with diabetes to monitor their condition regularly and send alerts via Bluetooth to an app on their own and their caregiver's phones if readings exceed normal ranges. Over time,

<sup>6</sup> "Managed care after acute myocardial infarction," 2021.

<sup>7</sup> Thomas G. Allison et al., "Digital health intervention as an adjunct to cardiac rehabilitation reduces cardiovascular risk factors and rehospitalizations," *Journal of Cardiovascular Translational Research*, 2015, Volume 8, Issue 5.

<sup>8</sup> "Digital health intervention in acute myocardial infarction," 2021.

<sup>9</sup> "A novel intervention including individualized nutritional recommendations reduces hemoglobin A1c level," 2017.

patients enrolled with Livongo have achieved a 0.8 percentage-point drop in HbA1c for diabetics, a 10.0-millimeter hemoglobin drop in blood pressure for patients with hypertension, a 1.8-point drop in body mass index, and a 7.0 percent drop in weight. Livongo allows payers and providers to identify and reward good behavior, as well as deter or penalize poor adherence to health plans prescribed by providers.

- **Personalized coaching and support.** Patients can connect with specific coaches to obtain a personalized diet and exercise plan tailored to their chronic illnesses. This can be very effective from a therapeutic standpoint. A meta-analysis of digital health interventions on blood pressure management showed that digital counseling alongside antihypertensive medical therapy reduced systolic blood pressure by 50 percent relative to controls.<sup>10</sup> For example, Hinge Health has built a \$6.2 billion business that offers wearable sensors combined with personalized exercise therapy and one-on-one health coaching.
- **Gamified behavioral modification.** Digital therapeutics solutions can include gamified challenges and incentives to track and drive adherence to prescribed diets, lifestyle practices, and medications. For example, Discovery, a South African health insurance company, encourages its members to make healthier choices through its Vitality behavioral change program that combines data analytics with rewards and incentives for healthier lifestyle choices.
- **Building a thriving community.** An active virtual patient community can drive adherence by

challenging and motivating patients to live up to their own health goals. For instance, one study of seven thousand patients with amyotrophic lateral sclerosis (ALS), multiple sclerosis, Parkinson's disease, HIV, fibromyalgia, or mood disorders found that nearly 60 percent thought the PatientsLikeMe health network helped give them a better understanding of the side effects of medications. The study also found that nearly a quarter of patients with mood disorders needed less inpatient care thanks to their use of the PatientsLikeMe site.<sup>11</sup>

- **Health mall.** A recent McKinsey survey found that 90 percent of healthcare leaders believe that patients interacting with digital health ecosystems want an integrated journey rather than point experiences or solutions.<sup>12</sup> Healthcare companies can meet this desire for integration by offering digital health malls that include access to prescribed medications, health supplements, wellness products, and diagnostic tests at the click of a button.
- **Patient education.** Digital education materials can give patients and their family members information on disease conditions, treatment options, diet, and healthy lifestyle choices. For instance, the Midday app launched by Mayo Clinic and digital health start-up Lisa Health provides support, including educational content, to women experiencing menopause.<sup>13</sup>
- **Advanced analytics to predict and prevent health events.** Organizations are working now to build data algorithms that could identify and predict triggers for healthcare events. They could suggest when to take preventative action or where lifestyle and behavioral changes might forestall adverse events.

<sup>10</sup> Ella Huszti et al., "Advancing digital health interventions as a clinically applied science for blood pressure reduction: A systematic review and meta-analysis," *Canadian Journal of Cardiology*, May 2020, Volume 36, Issue 5.

<sup>11</sup> "PatientsLikeMe," Agency for Healthcare Research and Quality, accessed January 2023.

<sup>12</sup> Stefan Biesdorf, Ulrike Deetjen, and Basel Kayyali, "Digital health ecosystems: Voices of key healthcare leaders," McKinsey, October 12, 2021.

<sup>13</sup> Tia R. Ford, "Lisa Health launches Midday, an app leveraging AI to personalize the menopause journey, in collaboration with Mayo Clinic," Mayo Clinic, July 19, 2022.

Find more content like this on the  
**McKinsey Insights App**



Scan • Download • Personalize



## How incumbents can thrive in the digital therapeutics space

Digital therapeutics have tremendous potential to reduce disease burdens, deliver better clinical outcomes, help providers make more informed treatment decisions, and improve patients' lives by offering better ways to manage chronic health conditions. Digital therapeutics also offer incumbents access to new sections of the healthcare value chain and a way to play in the much larger end-to-end healthcare market. Given these opportunities, healthcare and pharma incumbents may wish to explore ways to compete and win in this space.

Incumbents have certain inherent advantages in building digital therapeutics offerings. They already have direct access to patients, plus deep knowledge of the pain points in the disease management journey. They also fully understand the disease science that needs to be integrated into the digital health offering.

Still, incumbents also have some work to do to be competitive in digital therapeutics. To successfully launch and scale an offering, they may need to recruit or upskill employees with skills in product development, design, technology, medicine, data science, and strategic partnerships. Incumbents should plan to spend from three to five years building their digital capabilities and inculcating their new digital workforce with the culture, vision, mission, and values to compete successfully against nimble start-ups.

Incumbents that move quickly still have an opportunity to gain a first-mover advantage in the growing digital therapeutics sector, where promising start-ups can receive multibillion-dollar valuations. By developing their own digital therapeutics offerings, incumbents may also find themselves in a stronger position to protect their core businesses from being disrupted by others.

**Chirag Adatia** is a partner in McKinsey's Gurugram office, where **Samarth Shah** is a consultant. **Ralf Dreischmeier** is a senior partner in the London office. **Kirtika Sharma** is a partner in the Mumbai office.

Designed by McKinsey Global Publishing  
Copyright © 2023 McKinsey & Company. All rights reserved.