How Using 'Data for Good' Can Transform the Healthcare Market

By Francis Ho, Ph.D.

Senior Vice President, Managing Director and Co-Head of Samsung Catalyst Fund

You and a group of good friends sit down to a meal together. Someone proposes a toast—maybe 'Proost' in Amsterdam, 'Salud' in México City, 'Sláinte' in Dublin, 'Mabuhay' in Manila, or 'Gesondheid' in Johannesburg. Whatever the language, the sentiment is the same: 'To health.'

Good health is something that everyone appreciates.

But what about the healthcare market, which we turn to for that good health? How well does today's healthcare industry support our health?

Imagine you're a patient facing a serious disease, or even a minor illness. In the current healthcare system, you might be seen by multiple physicians with different specialties, be diagnosed using services—MRIs, x-rays, lab analysis—at various locations, receive multiple prescriptions with possibly harmful interactions, and be limited in treatment options depending on where you live or what your health insurance covers.

And everything you do while not inside clinical facilities—what you eat, how well you sleep, what work you do, whether you exercise regularly—happens out of sight of the medical experts.

What's needed is better coordination among all the siloed entities in the healthcare market, across their full spectrum. And this coordination can happen only with greater understanding predicated on information. In a word: **data**.

Using Data to Transform Healthcare

We often speak of the potential for data to transform, even in mature industries. And healthcare, a market that Deloitte projects will top US$10 trillion globally by 2022, presents a particularly ripe target for transformation. The healthcare industry is a microcosm of, or at least intersects with, nearly every other industry, from basic business concerns of marketing, manufacturing, and logistics to advanced technologies such as AI and robotics. Healthcare is the one industry that touches everyone at some point in our lives, and the stakes are especially compelling—literally a matter of life and death.

Yet transformation is a value-neutral term. After all, falling ill is as much a transformation as recovering from illness.

At Samsung, we believe it's important to use data and digital technologies to purposely steer transformation in the direction of 'good.' Addressing the complex challenges of healthcare—

to strengthen its prime directive of helping all people live healthier lives—requires all of us to come together to strike the right balance among innovation, safety, equity, and unintended consequences. A bonus benefit is that what works for healthcare can work for other industries, as well.

Let's look at how data might help address some fundamental healthcare challenges:

- Breaking down the barriers that inhibit efficiency, by connecting currently siloed healthcare operations.
- Improving care and controlling costs, by preventing diseases, detecting them earlier, tailoring treatments to individual needs, and streamlining drug discovery and development.
- Increasing access to healthcare both in modern urban centers and in poor and rural areas.

Challenge #1: Breaking Down Barriers to Increase Healthcare Efficiency

The healthcare industry's various sectors—payers (e.g., insurance companies or governments), providers (physicians, hospitals, clinics, etc.), patients, pharmaceutical companies, and medical device companies—operate largely as distinct entities, or silos. Interactions and handoffs between them are haphazard at best.

For instance:

- Data collected about a particular disease and its treatment options are not easily shared with those pursuing solutions to other diseases.
- Researchers and providers working in one area of medicine, such as cardiology or neurology, rarely have time to keep up-to-date in the latest advances outside their specialties.
- A patient treated and discharged from a hospital might leave with little or no follow-up, or even without the primary-care or admitting physician being aware that the patient was sent home
- People commonly receive prescriptions from a variety of physicians, without centralized monitoring for potential incompatibilities or interactions.
- Switching from one insurance provider to another can change which doctors and which treatments are covered.

Data and digital technologies can connect the threads among now-disparate healthcare silos, resulting in greater efficiencies as well as better health outcomes. The recent push toward value-based healthcare, which assesses care according to outcomes rather than the services delivered, also requires greater quantity and quality of data.

Effective healthcare solutions must consider the total health of each individual over a lifetime, including the 99% of health that happens outside of healthcare facilities—all the habits, behaviors, socio-economic factors (such as employment and education), and physical environment that contribute to overall health.

Sensor-based solutions that capture data about an individual's nutrition, exercise, and other daily living activities can help break down the barriers to healthcare efficiency. New sensors in wearables, consumer electronic devices, smart homes, and automobiles can automatically capture the full range of everyday health. Plus, data collected and measured for a period of time becomes 'longitudinal data'—i.e., data on an individual, tracked over time—which can provide valuable insight into a person's health over their entire lifetime.

Ultimately, data and digital technologies will make it possible for each of us to own all the data about our health—which we can control fully and share as we desire. That way, we gain greater control over and are better able to participate in our own long-term health.

Challenge #2: Improving Care and Controlling Costs

The ideal trajectory for healthcare, from both an outcomes and a cost perspective, is prevention of disease and unhealthful conditions if at all possible; early detection as the next-best option; applying precision medicine whenever treatment is needed; and using data-driven innovations to improve the process of developing new medicines.

Prevention strategies need to match the communities where they're applied.

In developed countries, for example, prevention focuses largely on mitigating the results of eating too much and moving too little. These lifestyle factors contribute to the chronic and mental health conditions that, according to the U.S. Centers for Disease Control and Prevention (CDC), account for 86% of the United States' $3.3 trillion in annual healthcare spending. Six in 10 adults in the United States have a chronic disease such as heart disease, cancer, chronic lung disease, or diabetes. When lost economic productivity is included in the economic impact of chronic diseases, the total reaches $3.7 trillion—equivalent to nearly 20% of the U.S. gross domestic product.

In these cases, data can help identify the actions that lead to chronic diseases and motivate people to change those behaviors.

In developing areas of the globe, however, prevention—and the use of 'Data for Good'—must emphasize ways to ameliorate poverty, malnutrition, exposure to toxic substances, preventable infectious diseases, and other life conditions that lead to poor health.

Regardless of which community you are from, data-assisted screening tools can help with the early detection of diseases by identifying chronic conditions such as diabetes and cancer at the very beginning of onset. Early detection makes it possible to intervene in ways that improve health and reduce cost.

Once a condition is detected, it can be subject to the innovation of precision medicine: "an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person," according to the U.S. National Institutes of Health (NIH). Precision medicine promises to make healthcare both more effective and less expensive.

A current example of precision medicine can be seen with Foundation Medicine, a molecular information company that combines genomic profiling and data services to help physicians better match patients with treatments while also spurring development of new therapies.

Also primed for transformation through data is the process of drug discovery and development. It's enormously expensive for pharmaceutical companies to develop new drugs, and success for new drugs is hit and miss. In a conversation with a16z (Andreesen Horowitz) general partners, Novartis CEO Vas Narasimhan said that on average over the last 20 years, only about 1 out of 20 new medicines that reach clinical testing actually work in the human body. Artificial intelligence (AI) and data analytics can raise these odds while significantly cutting drug discovery and development costs.

One way to increase the efficacy of therapies while reducing development costs is through the use of what's called real-world data (RWD) or real-world evidence (RWE). RWD/RWE encompasses patient data happening outside the bounds of clinical trials—such as observations by physicians; consumer, pharmacy, and hospital data; electronic health records; disease registries; and lab results.

Here's a recent example of the potential value of RWD and RWE. Flatiron Health is a company that built a proprietary medical records dataset for oncology. Although this dataset represented only 20% of U.S. cancer patient medical records, Roche in 2018 spent US$1.9 billion to acquire Flatiron. The value to Roche was that the Flatiron RWD dataset could be used to simulate the control arm of a clinical trial for a new lung cancer drug called Alecensa. Roche was able to secure health insurance coverage 18 months earlier compared to a conventional clinical trial—leading not only to earlier revenues for the pharmaceutical company, but also to earlier treatment for lung cancer patients.

Challenge #3: Increasing Access to Healthcare

Healthcare access ideally means care that's available anytime and anywhere.

In developed urban centers, access to healthcare is often tied to financial issues. For example, a U.S. person without health insurance might be surrounded by plentiful healthcare services but unable to access them due to lack of ability to pay for the services.

At the other end of the financial scale, a wealthy family with a child suffering from a rare disease that is life-threatening might be able to use their resources to expedite critical DNA sequencing services from a few weeks to a few days, obtaining results when literally every hour matters.

In the developing world or in rural areas, however, access suffers from the lack of medical facilities and/or personnel to serve people in the region. In these instances, data and digital technologies can extend access to healthcare beyond hospitals and clinics, via AI chatbots or telemedicine conducted using smart phones.

For people of all regions and socioeconomic types, the use of wearables and other personal sensor-based devices can provide anywhere, anytime monitoring of health conditions without the need to go to a clinic or lab to get checked.

Data-driven technologies can ameliorate all of these healthcare access challenges by decentralizing care, reducing cost, and improving convenience.

Fostering Data for Good in Healthcare

How can we encourage a data-for-good approach in healthcare?

We can begin by committing to work together to improve the health and lives of people across the globe. Experts and innovators in different fields can share their knowledge and collaborate to use each other's insights to advance their own work.

Collaboration creates a fertile environment for innovation to thrive. And collaboration, especially among people across a wide range of perspectives and expertise, is the best way

to unlock the 'potential energy' of opportunity to create the 'kinetic energy' of real-world solutions.

Investors have a role to play, too: rewarding and encouraging solutions and business models that have the potential to forge data-for-good pathways.

To help spur these efforts, we will present ongoing Catalyze a Better Future content—blog posts, videos, articles, and more—spanning multiple industries, starting with healthcare.

You can join the Catalyze a Better Future conversation through the Samsung Catalyst Fund website and on LinkedIn. And perhaps raise a toast, in whatever language you prefer, to good health for us all.

Catalyze a Better Future

Connections, insights, opportunity.
Together, let's use technology to solve
global problems.

SAMSUNG
CATALYST
FUND