



HEALTHCARE:
An Industry
Ripe for
Disruption
and Reform

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HEALTHCARE IN CRISIS: US

The healthcare industry is in turmoil. With higher incidence of chronic disease and ageing populations, the cost of healthcare only continues to grow. According to the World Economic Forum, global healthcare spending is projected to increase at an annual rate of 5.4% in 2017–2022, from USD \$7.7 trillion to \$10.1 trillion. Like most other industries, healthcare has recently faced significant disruption at the hands of new technological advances that facilitate improved communication, greater access to information and optimised operational efficiency, not to mention new medical equipment and procedures.

Healthcare provision has been immeasurably enriched by new, technologically-enabled medical services, procedures and products. For example, increasingly prevalent telemedicine services allow patients and doctors to communicate through video or instant messaging, saving both parties time while facilitating check-ups between visits. Moreover, new connected devices and monitoring tools such as biosensors allow healthcare practitioners to track their patients' health remotely, effectively improving the quality of healthcare they are able to provide through greater access to data, and even permitting preemptive intervention if readings indicate warning signs for serious conditions. Another example is laparoscopic surgery, which uses minute cameras and other electronic devices to enable surgeons to operate using far smaller incisions, which results in faster recovery times and shorter — and less expensive — hospital stays.

However, while technology has opened a number of new doors for the healthcare industry, it has also disrupted it in another way: patients have become empowered to be more discerning with regards to the quality — and critically, the cost — of healthcare provision. In other spheres of life, patients have become accustomed to being able to shop around for the best deal, using online comparison tools to find the best value for money. In the healthcare industry, however, patients do not have the same power as they have as consumers in other industries such as retail, largely due to the fact that healthcare providers in most countries continue to treat patients as consumers — and charge them accordingly.

Simply put, healthcare costs are prohibitive, and never more so than for individuals who cannot afford health insurance. The United States spent \$3.65 trillion — about 18% of its GDP — on healthcare in 2018. Yet, according to The Atlantic, the US has placed last in the Commonwealth Fund's annual ranking of the health systems of developed nations for the past 20 years. Prophet reports that an astounding 81% of individuals are unsatisfied with their healthcare experience, and the happiest ones are those who interact with the system the least.

Some 13.7% of US inhabitants are uninsured in 2019. The reasons vary: they can't afford coverage, don't qualify for Medicare, live in a state where subsidised Medicaid wasn't expanded, believe that Trump 'repealed Obamacare', or they're undocumented. These uninsured individuals are typically charged four times what care providers would accept from Medicare for the exact same service, and often far more. This is mainly due to the fact that insurance providers represent large numbers of customers and thus have leverage to negotiate prices down. Public health insurers like Medicare conduct extensive research into what it actually costs hospitals to deliver every type of test, treatment or service (factoring in expenses such as overhead, salaries and insurance), and reimburse them accordingly. Likewise, private insurers negotiate for discounts from providers' standard rates, but even these reduced rates are no walk in the park, and patients are often subject to significant co-payments.

Meanwhile, uninsured individuals get charged exorbitant fees corresponding to each individual healthcare provider's chargemaster list, which bears little relation to other hospitals' charges or the actual cost of the treatment, as revealed by Steven Brill Monday's critical Time exposé, which shows how even non-profit hospitals routinely hyperinflate prices. An example cited by Monday illustrates the enormous chasm between cost and price: \$199.50 was charged for a troponin test as per the hospital chargemaster, compared to \$13.94 paid by Medicare for the same test administered by the same hospital. This is just the tip of the iceberg — this pattern holds true for treatments, tests and services across the board.

Consumers — even those with comprehensive insurance coverage — do not feel that they are able to make informed choices about the care they receive. In the US in particular, there is a pronounced lack of transparency around the true cost of healthcare, despite the fact that as of January 2019, hospitals are legally required to "make public a list of their standard charges via the Internet in a machine readable format, and to update this information at least annually, or more often as appropriate". At best, this allows patients to compare the price of specific treatments across various providers. However, according to a recent Quartz investigation, actually locating and navigating this chargemaster is problematic, as the directive imposed by the Centers for Medicare and Medicaid Services (CMS) is vague enough to give providers significant leeway in terms of where and how they publish this information. In many cases, it seems like this information is deliberately obscured by bad user experience (UX) design tactics such as hiding it within sub-menus requiring numerous clicks and extensive scrolling, barely legible text or missing search bars, requiring patients to click through hundreds or even thousands of pages to find specific items.

To make matters worse, most of the entries are written in codes and terminology completely incomprehensible to the layperson. While this is certainly a step in the direction of transparency, the average healthcare consumer simply isn't equipped to assess this information in order to accurately predict the cost of their care or compare the cost of various treatment options. Clearly, there is much to be done in terms of improving transparency and competition in the healthcare industry, creating enormous opportunity for stakeholders in this space to fill the gaps between consumer expectations and current service delivery.

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TOWARDS A VALUE-BASED CARE MODEL

One alternative that has been proposed as a potential solution to the US healthcare crisis is a shift from volume-based reimbursement to value-based care (VBC) models. Initially proposed by Harvard economist Michael Porter, value-based care is a healthcare delivery framework that seeks to optimise patients' health outcomes through higher quality care at lower costs. In essence, value-based care incentivises healthcare providers to deliver patient outcomes, rather than focusing on service volume. In the current fee-for-service model, providers are paid separately for each individual medical service, which has the negative side effect of incentivising unscrupulous providers to tack on unnecessary tests and services to add to the bill. In a VBC model, considerations such as quality, efficiency, safety and patient experience are encouraged while unnecessary, wasteful and expensive diagnostic and therapeutic interventions are reduced. In VBC models, the patient is the central focus and hospitals are rewarded for helping to keep people healthy and for improving the health of those who have chronic conditions in evidence-based, cost-effective ways. Value-based care focuses on 360-degree patient health, connecting departments to remove silos and improve overall health in the long-term.

“When providers are incentivised to maintain health rather than respond to illness, they treat patients earlier in low-cost environments, like neighborhood clinics, before health problems become serious and require expensive care in a hospital setting. Those who can deliver more value by keeping patients healthy should be able to share in the savings of the healthcare expenditures they have reduced.”

— Dr. Kenneth L. Davis, president and CEO of Mount Sinai Health System.

HOW DO WE GET THERE?

A key step towards widespread implementation of value-based care, according to the World Economic Forum, is finding ways of measuring and standardising outcomes in relation to per-capita costs. By assessing which outcomes matter to particular patient samples, providers can derive insights about population segments and adapt and tailor care accordingly for similar cases to provide optimum value. Over time and with improved data capturing and analysis, this process can be further refined to provide hyper-personalised, efficient and cost-effective care.

The next step, of course, is assigning an objective price determined by the value provided, i.e. how well the system performed. This will be aided by the rapidly evolving realm of healthcare informatics, which are increasingly removing silos between various operational processes, allowing for system analysis and optimisation, as well as facilitating the objective measurement of patient-reported healthcare outcomes. The most challenging barrier to adopting the VBC model is the need for widespread reimbursement reform among government payers, insurers and care providers.



One example of an insurer embracing VBC is **AETNA**, which has pledged to have value-based arrangements in place for 75% of all claims by 2020. In 2017, the company reported that 7.2 million of its plan members already received care through VBC initiatives, representing roughly 53% of the company's claims.



KAISER PERMANENTE, a non-profit insurance plan active in eight states and the District of Columbia, partners with various hospitals and outpatient facilities to provide value-based care to its members. It sets a fixed annual amount for each member, creating an intrinsic incentive to keep them as healthy as possible to reduce the need for hospital care, which is where most healthcare costs accrue.



Pharmaceutical and healthcare companies are striving to implement pilots and prove the effectiveness of value-based solutions in order to benefit from new payment frameworks. A good example is **MEDTRONIC'S** pilot project in Latin America. The medical devices company has been able to reduce the mortality rate related to segment elevation myocardial infarction by 30%, thanks to better care coordination enabled by its products and monitoring system.

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HEALTHCARE ECOSYSTEMS

Another key shortfall in the healthcare industry as it stands today is a lack of continuity in patient care. Once a patient leaves the hospital or clinic, their care often ceases completely, with little to no post-treatment engagement or monitoring. This shortfall could mean that their recovery stalls, their condition worsens or they avoid follow-up consultations for fear of incurring further costs, instead self-medicating to resolve symptoms such as pain instead of addressing the underlying condition — one of the causes behind the US opioid crisis. A lack of continuity in care can also result in a fragmented or incomplete medical record among various clinics and institutions, which can impact the quality of care a healthcare practitioner is able to provide.

There is a marked gap in between provider and patient perceptions of the quality of experience currently being provided, with providers underestimating the degree to which the patient experience fails to meet consumers' expectations. This skewed perspective is resulting in a lack of urgency among providers to fix the problem.

In short, it is becoming essential to provide consumers with access to the information and engagement they seek. Digital solutions — and considered, accessible UX design — are key means of achieving this and also allow healthcare providers to offer value adds to differentiate themselves. For instance, a healthcare app that offers on-demand services such as the ability to obtain individualised medical information, real-time diagnostics, and remote access to health experts, has enormous potential in terms of supporting patients with ubiquitous care that addresses as many of their health care needs as possible — whenever and wherever they need it.

A growing number of hospitals and healthcare centres around the world are creating healthcare ecosystems facilitated by technology and comprised of collaborations between various physicians, specialists, patients and health insurance providers. The goal of such ecosystems is multifaceted: to improve the quality of care through more holistic treatment, provide a better experience for the patient, and to decrease the cost of providing that care. Previously understood simply as a 'system', healthcare may become better understood as an 'ecosystem' of interconnected stakeholders, each charged

with a mission to improve the quality of care while lowering its cost. These stakeholders are building new relationships that extend beyond the walls of the hospital in order to ensure patient safety and quality of care while realising savings.

A healthcare ecosystem comprises systems and processes that allow stakeholders to share, exchange and access all manner of healthcare information, connecting individuals, patients, providers, hospitals, researchers, payors and suppliers. Each stakeholder is involved in the creation, exchange and/or application of health information or data. An efficient healthcare ecosystem provides an information infrastructure that uses technical protocols to enable seamless and secure capture, discovery, exchange and utilisation of health information.

In a hyperconnected healthcare ecosystem, it's not just the patient who benefits. Medical professionals gain access not only to the individual patient's health records but also information pertaining to diagnosis and treatment in similar cases, as well as the latest research into specific conditions. Artificial intelligence assistants may aid in tasks such as diagnosis. Integrated, decentralised databases mean that finding an available hospital bed, specialist, surgery theatre or organ donor becomes effortless. Meanwhile, greater inter-facility cooperation (facilitated by improved event tracking capabilities) allows for the increased availability of resources. The same tracking capabilities also allow for greater efficiency in facility operations management, enabling the automation of processes such as ordering from suppliers, sterilizing equipment, laundry and disposing of medical waste.

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TECH COMPANIES STEP UP TO FILL THE GAPS

Between the attractive growth opportunities presented by the trillion-dollar healthcare market and the ageing technology infrastructure, numerous technology companies are taking action to address prevailing pain points in the healthcare industry. We are witnessing a number of promising initiatives and collaborations involving technology-focused competitors, as well an interesting trend of companies seeking to offer their employees improved healthcare benefits as a means of differentiating themselves as employers.

January 2018:

Apple launched a significant update to its Health app, which allows patients to access their health records via their iPhone. The updated Health Records section within the Health app brings together multiple hospitals, clinics and providers, making it easy for users to view their available medical data whenever they choose. Johns Hopkins Medicine, Cedars-Sinai, Penn Medicine and other participating hospitals and clinics are among the first to make this beta feature available to their patients.

January 2018:

Amazon, Berkshire Hathaway, and JPMorgan announces a partnership to tackle challenges in employer-sponsored health plans. The three companies will pursue this objective through an independent company that is free from profit-making incentives and constraints. The initial focus will be on finding technology-based solutions that will provide US employees and their families with simplified, high-quality and transparent healthcare at reasonable prices.

○ February 2018:

Apple announces the launch of AC Wellness, a chain of clinics available to employees and their families and presumably a test bed for future Apple health products. "AC Wellness Network believes that having trusting, accessible relationships with our patients, enabled by technology, promotes high-quality care and a unique patient experience," the company wrote on its webpage.

○ March 2018:

Salesforce partners with Cerner to better manage patients and their data between healthcare encounters. This integrated solution is designed to meet healthcare providers' growing demand for enterprise-wide CRM capabilities. The solution is also positioned to support health system call centres, service operations, provider network management, marketing, and other enterprise stakeholders that are transforming how services are delivered to patients and providers through an array of communication channels.

○ March 2018:

Google launches its Cloud Healthcare API to drive interoperability between various healthcare providers' systems. Google Cloud's goal for healthcare is very much a reflection of Google's overall mission: to organise the world's information and make it universally accessible and useful. Applying this mission to healthcare means using open standards to help enable data sharing and interactive collaboration, while also providing a secure platform.

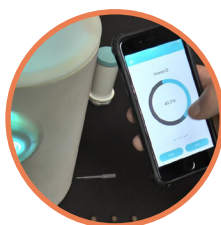
○ June 2018:

Apple opens up its Health Records API to developers, potentially enabling the creation of a functional Health App Store. Apple delivered a Health Records API for developers and researchers to use to create an ecosystem of apps that use health record data to better manage medication, nutrition plans, diagnosed diseases and more. The Health Records feature allows patients of more than 500 hospitals and clinics to access medical information from various institutions, organized into one view on their iPhone. For the first time, consumers will be able to share medical records from multiple hospitals with their favourite trusted apps, helping them to improve their overall health.

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SELF-CARE AND CO-CARE TOOLS

Patients have shown interest in healthcare tools that allow them to co-manage their health with healthcare professionals. Medical apps can facilitate and simplify interactions between medical experts and patients, improve access to medical and patient data, and foster quick collaboration among healthcare professionals. Other self-care tools allow patients to self-diagnose certain conditions through at-home tests and simplify monitoring and treatment for conditions such as diabetes.



BOWHEAD HEALTH develops iOS and Android apps to make self-care more personalised and secure through its blockchain-enabled wellness tracking app. Bowhead users can earn Anonymous Health Tokens (AHT) as rewards for tracking daily healthy behaviours such as sleep, mindfulness and energy, and eventually redeem those tokens for health-related products and services in the app's marketplace.



CAREPASSPORT is a healthcare app enabling patients to access and aggregate their medical data, including medical images, lab results, dental records, clinical reports and more from different healthcare providers. Patients can consolidate their medical records from any healthcare provider, imaging CDS platform, fitness tracking wearable apps like Fitbit, health kits, health forms, CDA Files, JPEG, PDF documents or any self-reported medical records.



iTBra, developed by Cyrcadia Health, uses a wearable to reimagine early breast cancer detection. The user simply wears dual breast patches as a bra insert. These patches monitor circadian metabolic changes in heat which correlate to accelerated cellular activity associated with breast tumors. The data is sent straight to a computer or mobile device and is easily shared with physicians. The creators of iTBra say their product not only puts health in the hands of women, but could reduce the 1.2 million unnecessary breast biopsies that occur worldwide.



L'ORAÉL'S UV SENSE, launched at the 2018 CES tech conference in Las Vegas, is a tiny wearable intended to make users more aware of the effects of UV light. The UV Sense, built for the brand by the wearables company MC10, is a battery-free sensor just nine millimetres in diameter and two millimetres thick, which can be worn on the thumbnail for up to two weeks to measure UV exposure. The idea is to alert users to the times throughout their day when they are most exposed to UV rays so that they can take simple steps to protect their skin.



WebMD is one of the most well-known symptom-checkers on the net. It is used by millions of people every day for symptom checking and now has an app to further extend its reach. The app, unlike its online checker, includes medication reminders, habit and fitness tracking, first-aid tips, a drug database, as well as other educational content. Users can also use the application to help them find and arrange an appointment with a nearby physician.



BODYTRACK is a wearable monitoring solution for customers in industrial health and safety, defence and first responder markets that want to achieve better employee health and performance. From one small non-invasive in-ear device, key vital sign parameters including core body temperature, heart rate, VO2 and motion (including fall detection) are measured and sent in real-time to a cloud-based analytics platform. The platform utilises proprietary algorithms and machine learning libraries to provide health and wellbeing alerts via a simple and configurable user interface, in order to enable early intervention to improve outcomes and reduce injury.



FREESTYLE LIBRE is a wearable glucose monitoring system. A small sensor, worn as a patch on the skin, automatically measures and continuously stores glucose readings day and night. With every scan, the patient gets their current glucose reading, the past eight hours of glucose data and an arrow showing the direction their glucose is heading. The app sends data on blood glucose levels to an app, allowing the wearer to easily check their information and detect trends. The app also allows for remote monitoring by caregivers, which could include the parents of diabetic children or the relatives of elderly patients.



PROTEUS DIGITAL HEALTH has created pills that emit a small signal once absorbed, which is picked up by a sensor worn on the body. The data is then relayed to a smartphone app, confirming that the patient has taken their medication as directed. Proteus has so far tested the system with pills for treating uncontrolled hypertension and Type 2 Diabetes, as well as antipsychotic medication. Indigestible sensors can help to track and improve how regularly patients take their medication, enabling a more informed dialogue between physicians and patients about treatment.



TRIGGERFISH is a non-invasive smart contact lens developed by Swiss company Sensimed. Triggerfish automatically records changes in eye dimensions that can lead to glaucoma. First developed in 2010, Triggerfish is now CE-marked and FDA-approved, meaning it is approved for marketing and sale in Europe and the US, and was approved for sale in Japan in September 2018.



ROCHE launched a Bluetooth-enabled coagulation system that allows patients to check how quickly their blood clots. This is the first device of its kind for anticoagulated patients, with self-testing shown to help patients stay within their therapeutic range and lower the risk of stroke or bleeding. Being able to transmit results to healthcare providers means fewer visits to the clinic. The app also allows patients to add comments to their results, reminds them to test, and flags the results in relation to the target range.

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OPPORTUNITIES IN HEALTHCARE

There is much to be done to ensure that everyone has access to quality healthcare. Ultimately, the business of making healthcare affordable and accessible to everyone will come down to policymakers. Nonetheless, there are countless opportunities for stakeholders in the healthcare industry — as well as adjacent industries such as information technology — to fill gaps and answer needs, contributing to improving care delivery and efficiency to build towards a truly seamless healthcare ecosystem.

There is much room for cutting costs, creating a need for suppliers that can offer more affordable options in terms of medical equipment ranging from lancets to hospital beds and MRI machines. Likewise, research leading to more affordable pharmaceuticals and less invasive medical procedures can play an important role in bringing costs down.

One of the biggest current opportunities in the healthcare industry lies in the technology sector. While a number of startups have ventured into this field already, there is much room for growth. There is a need for applications and back-end infrastructure to consolidate data from various parts of the healthcare system to improve collaboration between various practitioners and institutions and improve transparency. Companies that specialise in data analytics and informatics, as well as cybersecurity, will likely do well in the new healthcare industry.

With the massive growth in the popularity of self-care tools facilitated by healthcare apps and telemedicine, this area also represents a significant opportunity.

There is also a need to make healthcare accessible in more ways than financially: patients often don't understand their condition or treatment as well as they could, and information about treatments — and their cost — is frequently opaque difficult to obtain. This leaves patients disempowered and adrift, an experience exacerbated by the fact that they have easily - understood information at their fingertips in almost every other industry. As such, there is an enormous opportunity for improvements in customer experience and user experience design.

This is an industry ripe for disruption and reform, making it a crucible for innovation. Will you be part of the solution?

These are just a few of the opportunities emerging in the rapidly changing health-care industry. To find out more about how this industry is transforming and how your company can take advantage of these shifts, contact Lacuna Innovation. Our innovation experts can help you to identify unmet consumer needs and opportunities and help you map a path to implementation.

ABOUT LACUNA

Lacuna Innovation is a boutique consultancy that helps global organisations to sustainably innovate new products, services and business models by combining trend, insight and commercial expertise in one place. We identify new growth opportunities, immerse ourselves in markets and build in-house innovation capabilities to achieve lasting impact.

Harnessing an environment of tangible tech and creative collaborations, we can help you bring identified opportunities and concepts to life through experimentation and prototyping. With offices in Cape Town, Nepal and Germany we have global recognition, credibility and reach, which allows us to be at the forefront of Front-End Innovation (FEI).

We are innovation architects in the business of building tangible and sustainable futures. We work with companies to facilitate their innovation efforts using our proprietary innovation methodology.

We are not a branding or advertising agency. We seek opportunities for our clients to ensure that they remain competitively innovative. We identify and monitor trends that impact our clients' businesses, and assist them in identifying innovation opportunities to be pursued through focused research, a series of workshops, and a unique understanding of the unmet needs of consumers. Our proactive approach to FEI allows us to move beyond concept development to developing Proof-of-Concept design, prototyping and ultimately, commercialisation.

To find out how we can help you, reach us at hello@the-lacuna.com

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