Deloitte.

The Health Hub
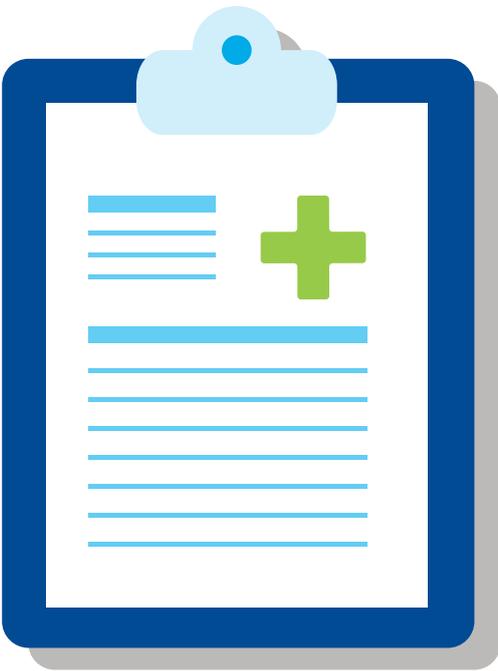## Transformation for the new normal

A need for healthcare innovations

We have all heard the adage that economic development results in higher standards of living. There is truth in that, of course, but the reality is always less clear-cut. While rapid progress has pulled millions out of poverty in Southeast Asia, it has also left a number of unique challenges in its wake. These issues span across a variety of disciplines but, arguably, one of its largest impacts has been on the healthcare sector.

As populations gain affluence, lifestyles become more sedentary, consumption of high-calorie food increases and birth rate falls. All these contribute to an ageing population that is more predisposed to chronic diseases. While this is not a new population health issue, it is the alarming rate at which chronic diseases are increasing in Southeast Asia – diabetes and obesity cases in Southeast Asia quadrupled between 1970 and 2005, which is twice the rate for the United States (US) in the same time period[1] – as well as the region's lack of access to quality and affordable healthcare, that is worrisome. Solving these problems with traditional approaches is unlikely to yield meaningful results; these efforts will only result in a never-ending spiral of playing catch-up with ever-increasing healthcare demand.

A different strategy is needed – one that enables us to do more with less. The need to break seemingly immutable trade-offs naturally lends itself to disruptive innovation and, as we will see, the roots of many such innovations have already begun sprouting in Southeast Asia as alternative solutions to age-old challenges.

1   In Brief: "Unprecedented" chronic disease growth in Southeast Asia. IRIN Asia. 25 January 2011. http://www.irinnews.org/report/91723/in-brief-unprecedented-chronic-disease-growth-in-southeast-asia

A revolution on the horizon

It has been said that 'patients' are called as such because of the inordinate amount of *patience* that is required of them when waiting for their turn at the doctor's office.

With the advancement of healthcare in recent years, perhaps today's patients might be better described as consumers of healthcare. Accustomed to constant connectivity and instant access to information, patients these days are engaged and seek to take ownership of their own health by leveraging technology to access novel solutions, which they then customise for their own needs.

Indeed, a healthcare revolution is on the horizon. Faced with the challenges of healthcare accessibility and affordability, a number of local companies, technology start-ups and health organisations have begun introducing innovative telehealth applications to serve the consumers in Southeast Asia. These applications provide consumers with the ability to communicate with their health providers over their mobile devices or even participate in remote consultations with their doctors in virtual consultation rooms. Smart home monitoring systems that closely track the vital indicators of consumers who have chronic conditions and require long-term care are also on the rise.

As healthcare delivery systems evolve to deliver a holistic, seamless and individualised experience for each and every consumer, hospitals, too, are working to integrate individual health records across the entire ecosystem into a single view of the consumer to ensure seamless healthcare experiences at every touch point, regardless of the hospital, general practitioner or healthcare provider. At the same time, they are tapping on health analytics to unearth unexpected insights and increase the efficiency and efficacy of the system.

Our vision of the future healthcare ecosystem encompasses much more than that: it is preventive, not reactive; and cohesive, not episodic. In the following pages, we take a look at some of the driving forces in the Southeast Asia healthcare landscape, and present a model, the Health Hub, that seeks to address our current healthcare challenges and integrate healthcare delivery across the three pillars of Human, Home and Hospital. Finally, we envision some of the characteristics that we would like to see in this future healthcare ecosystem and conclude by addressing a few issues that will need to be tackled for its successful execution.

Driving forces in a changing landscape

Southeast Asia's healthcare landscape is a dynamic and heterogeneous one. The region consists of health markets at various stages of development, lying on a continuum between the nascent markets such as Cambodia and Lao PDR, and the advanced, state-of-the-art markets like Singapore. Nevertheless, three key driving forces resonate across most – if not all – of its markets and are likely to continue shaping its changing landscape in the foreseeable future.
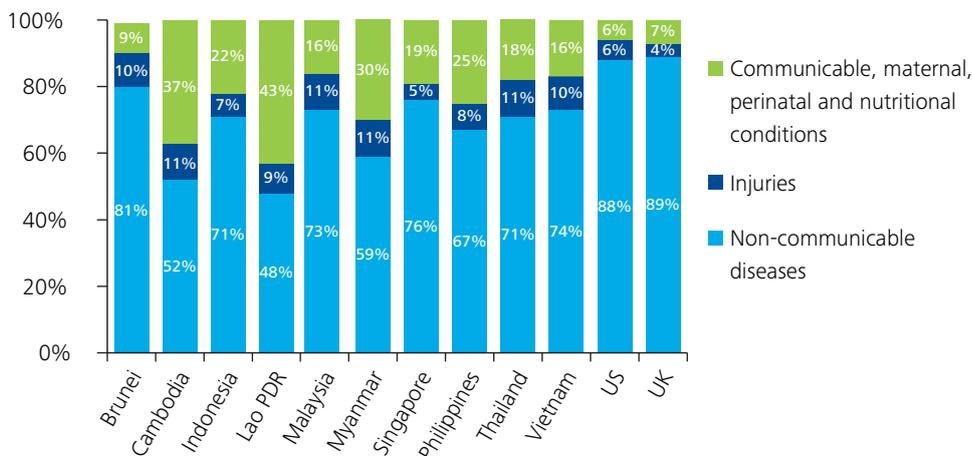
Chronic diseases

Southeast Asians are living longer than ever. In 1990, the average life expectancy at birth was 65.2 years; by 2012, it has risen to 72.9 years[2]. Yet whether these extra years are spent in the pink of health is debatable. While rapid economic development tends to result in a reduction in the incidences of communicable diseases, the same cannot be said for non-communicable diseases. Indeed, chronic, non-communicable diseases often have a positive relationship with economic development, with the most developed countries generally having higher incidences of such diseases (see Figure 1).

Driven by a host of factors including changing lifestyles and ageing populations, the list of chronic diseases is extremely long, with diabetes beginning to emerge as one of the biggest culprits. In Malaysia, for example, an alarming 3.6 million adults are estimated to be affected by diabetes, putting it in the number one spot amongst ASEAN countries and sixth in the western pacific region for having the highest number of diabetics[3].

But with the emergence of remote monitoring technologies, managing chronic diseases and preventing the development of serious complications which require complex medical interventions and hospital admissions are becoming easier. In the case of diabetes, patients often lose the sensation of pain and become unaware of developing foot ulcers that may result in foot or leg amputations. Imagine then, having a pair of SmartSox or socks made from cutting-edge, intelligent textiles that use fiber optics and sensors to monitor temperature, pressure and joint angles in the feet. If it detects a developing problem, it will then alert medical professionals and wearers of the socks to take the necessary actions and thus avoid the need for an amputation[4].

Figure 1: Proportional mortality[5]

Legend:
- Communicable, maternal, perinatal and nutritional conditions
- Injuries
- Non-communicable diseases

Data by country:
- Brunei: 81% / 10% / 9%
- Cambodia: 52% / 11% / 37%
- Indonesia: 71% / 7% / 22%
- Lao PDR: 48% / 9% / 43%
- Malaysia: 73% / 11% / 16%
- Myanmar: 59% / 11% / 30%
- Singapore: 76% / 5% / 19%
- Philippines: 67% / 8% / 25%
- Thailand: 71% / 11% / 18%
- Vietnam: 74% / 10% / 16%
- US: 88% / 6% / 6%
- UK: 89% / 4% / 7%

2   Global Health Observatory Data Repository. World Health Organisation. http://apps.who.int/gho/data/node.main.688
3   Number of diabetics in Malaysia alarming. The Star. 16 July 2013. http://www.thestar.com.my/News/Nation/2013/06/14/Number-of-diabetics-in-Malaysia-alarming/
4   UA Studies Use of 'Smart' Socks to Prevent Amputations in Diabetes Patients. UANews. 12 March 2013. http://uanews.org/story/ua-studies-use-of-smart-socks-to-prevent-amputations-in-diabetes-patients
5   Noncommunicable diseases country profiles 2014. World Health Organisation. http://www.who.int/nmh/countries/en/

Access to healthcare

Despite the region's rapid economic development, millions of Southeast Asians today still lack access to affordable, quality healthcare. Indeed, many of the region's healthcare systems face an acute funding shortage: with the exception of the more developed health markets such as Brunei, Malaysia, Singapore and Thailand, per capita spending in most Southeast Asian countries averages less than USD 250 annually, a stark contrast to the spending in developed markets in the US and United Kingdom (UK), which ranges in thousands of dollars (see Figure 2). This lack of funding means that much-needed investment in healthcare infrastructure, such as hospitals, equipment and technologies, will have to be foregone. While some of the more developed areas have sufficient numbers of doctors, nurses, and midwives, many of the less developed countries will fail to meet the World Health Organisation's most basic healthcare workforce standards.

Improving healthcare delivery systems will require billions of dollars in investments and – if it can be done – time. But as more people in the region begin to gain access to connected devices, many organisations are beginning to see the potential to improve healthcare delivery through web and mobile applications[6]. As a result, Southeast Asia is beginning to witness an explosion of eHealth apps, ranging from areas such as telehealth, to hospital information systems and medical education.

Figure 2: Total expenditure on health per capita at Purchasing Power Parity, by country (2013)[7]
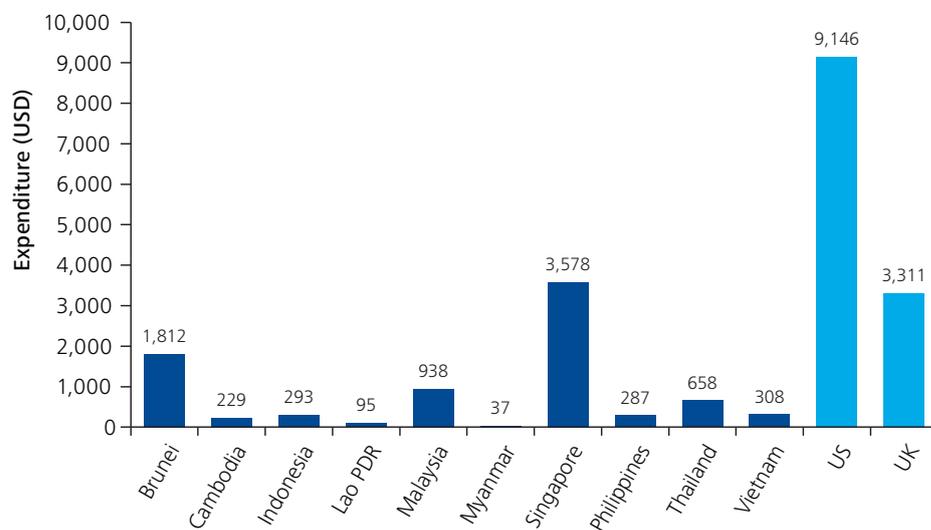
6   Southeast Asia's Health App Explosion. Forbes. 15 October 2014. http://www.forbes.com/sites/techonomy/2014/10/15/southeast-asias-health-app-explosion/
7   Global Health Expenditure Database. World Health Organisation. http://apps.who.int/nha/database/ViewData/Indicators/en
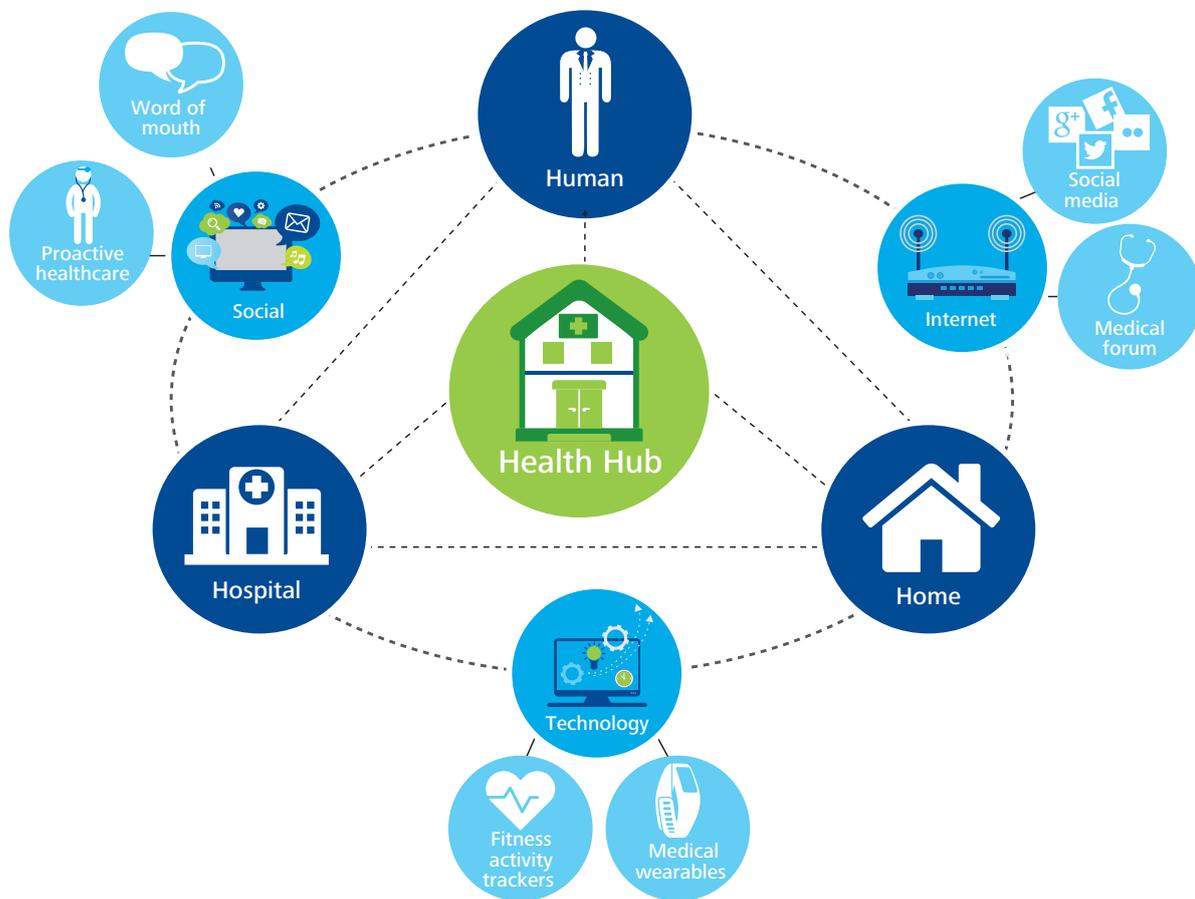
The new patient archetype

Outside the healthcare system, digital technology has enabled low-cost, rapid, and often instantaneous access to products and services. Consequently, consumers have access to a great deal of information and a plethora of products and services. With just a few clicks, they can select delivery schedules to fit their needs, provide real-time feedback, share information about goods or services with their online networks, and receive personalised recommendations based on their purchase history. They have come to expect to have the ability to configure products and services to specifically meet their personal needs around factors such as price, location, and timing.

Accustomed to high levels of service and control in their relationships with other product and service providers, consumers are likely to demand a similar level of service and control from their relationships with healthcare providers and the organisations supporting them. As they take on greater accountability for the total cost of their healthcare, there will be a shift in their mindset. Their focus will be expanded from the treatment of disease to a broader wellness agenda. Correspondingly, they will need resources and tools that are not historically available to help them manage their newfound accountability and navigate the complexity of the healthcare system[8].
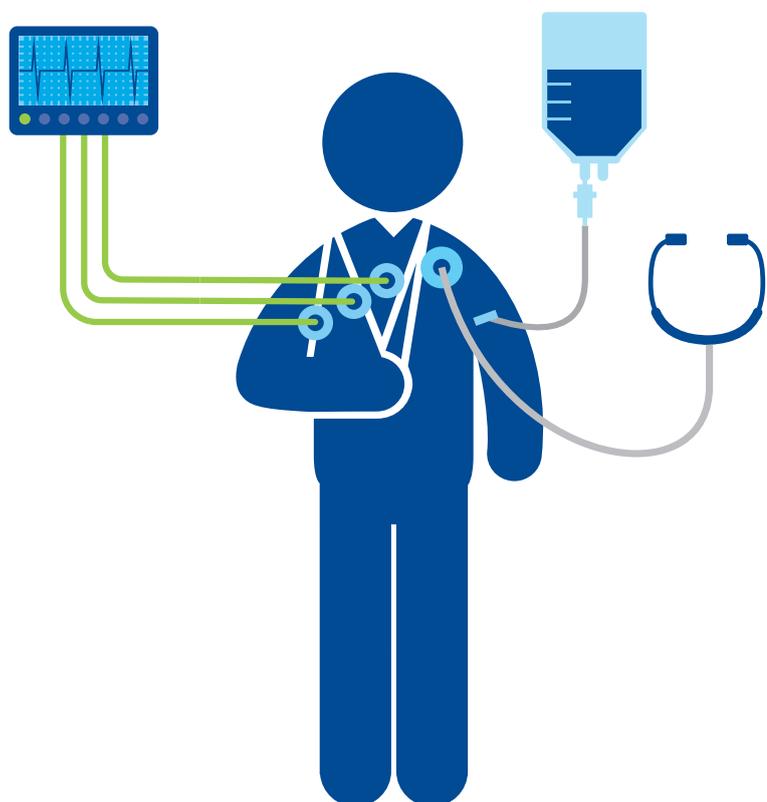
8   A consumer-driven culture of health. Deloitte University Press. 18 February 2015. http://dupress.com/articles/future-of-us-health-care/?ind=73

The Health Hub

Health Hub

Human

Home

Hospital

Technology

Social

Word of mouth

Proactive healthcare

Social media

Internet

Medical forum

Fitness activity trackers

Medical wearables

The healthcare model of tomorrow is envisioned to be an open healthcare ecosystem. Known as the Health Hub, it is consumer-centric, leverages technologies to overcome the barriers of access, and provides support for long-term, chronic disease treatment seamlessly from across three pillars – Human, Home and Hospital – and beyond.

The healthcare scenario below may come across as a little futuristic, perhaps even idealistic, but many of the elements that will enable it to come to fruition already exist today. In the next section, we will explore the role of each of the pillars in the Health Hub ecosystem.

Have you met Ed?
A hypothetical scenario describing a patient's experience with the Health Hub

Ed, a 58-year-old sales manager, pours himself a cup of coffee as a colleague walks into the office kitchen.

"Welcome back, Ed! How are you feeling?" his colleague asks.

"Better now," Ed answers, "but it's been a long couple of years; I was pretty close to giving up hope on battling my condition."

Ed has chronic obstructive pulmonary disease and congestive heart failure. Two years ago, Ed couldn't seem to stay out of the hospital: Each check-in with his local primary care physician resulted in more visits to various specialists for repetitive, often contradictory, care. He had been to see at least four different care providers and was on so many different pills that he couldn't keep everything straight. Unable to work, Ed had to go on short-term disability, and he worried about losing his job altogether. He felt like a burden to his family.

"I was about to give up," Ed tells his colleague, "but then I got plugged into this community of patients, providers, and suppliers – they're from all over the globe, and everything is digitally integrated. I work with a coordinated care team that specialises in my specific profile, and my care is always personalised to my specific needs. It was such a relief to have a seamless healthcare experience. Everyone talks to each other. Every specialist I went to see was prepared with my information, so the visits were efficient. I never felt like I had to backtrack or worry that they might unknowingly recommend anything that conflicted with something I was already doing or taking."

Today, Ed's vitals are stable and he is back to being productive at work. Thanks to a new biometric monitoring device, Ed's care team sees a daily record of his weight, heart rate, oximetry, and sleeping patterns. Ed's digital diary helps him and his care team track patterns in his well-being. Recently, Ed began participating in a study group, and he is hopeful for future breakthroughs[9].

9   A consumer-driven culture of health. Deloitte University Press. 18 February 2015. http://dupress.com/articles/future-of-us-health-care/?ind=73

Human

An active and engaged consumer is at the core of the Health Hub. Seeking to curate and take greater ownership of their own experiences, today's consumers now approach healthcare just like other services. Before making a decision, they do their research, read professional reviews and then get up-to-speed with word of mouth.

Today, it is a whole new world when it comes to healthcare. While the healthcare system may at times seem confusing or even intimidating, consumers are increasingly learning more about the system by leveraging their constant connectivity for instant access to information on health conditions and health providers, playing active roles in their own healthcare to gain greater mileage from the resources at their disposal.

They use sites like DocDoc, for instance, a medical appointment-booking platform designed to transform the healthcare experience in Asia Pacific. With just a few clicks, consumers are able to search for doctors in Malaysia, Philippines, Singapore and Thailand by specialty, location and credentials, and immediately book an appointment with them.

But those living in one of Indonesia's big cities and dealing with its notorious traffic jams might be discouraged from even leaving the house at all, especially if their ailments are minor. Instead, they turn to the TanyaDok site, where tech-savvy consumers accustomed to asking questions on the Yahoo Answers community can similarly post their questions to doctors using its online forum. Its medical editorial team and hundreds of contributing doctors which consist of general physicians, dentists, and an array of experts, such as specialist doctors and senior consultants, strive to answer all questions as soon as possible, usually in less than one hour[10].

This consumerism extends to more than times of illnesses. Increasingly, consumers understand that prevention is better than cure and are beginning to adopt the use of wearables and fitness activity trackers to monitor their food intake and assist with physical activity. The interactive Diet and Activity Tracker (iDAT) app, developed by Singapore's Health Promotion board even takes into consideration Asian body types and the Singaporean working lifestyle to help users count their calories, manage their health, and share their progress with their loved ones on Facebook[11].

Book a DocDoc

DocDoc is an alternative solution for busy lines, missed calls, voicemails, 'place on hold', and other frustrations patients experience in their moment of need and at any time of day or night.

Created with the aim of transforming the healthcare experience in Asia Pacific's healthcare markets, which can sometimes be difficult to navigate, DocDoc provides a free service that enables patients to find a nearby doctor or dentist, credibly research and understand their clinical interests and specialties, assess their academic credentials and achievements, and instantly book an appointment with their connected devices.

Throughout the continuum of care – from initial research, to time of care and post-treatment – DocDoc educates patients with wellness tools, information on procedures or conditions, specific care guidelines, and offers them access to specialty information centres. In addition, DocDoc is able to suggest physicians and other providers based on the illness or condition that patients are researching.

DocDoc was founded by veteran professionals from both the Healthcare and Technology industries and funded by some of the most successful tech entrepreneurs such as 500 Startups, and Michael Brehm[12].

10   TanyaDok Gives Patients a Consultation Room with Doctors Without Borders. Tech in Asia. 11 September 2012. https://www.techinasia.
     com/tanyadok-patients-consultation-room-doctors-borders/
11   Top Apps To Stay Fit. Health Promotion Board. http://www.hpb.gov.sg/HOPPortal/breathe-article/HPB-047446
12   About DocDoc. DocDoc. https://www.docdoc.sg/pages#about

Home

As smartphone and other devices become increasingly commonplace, many companies – including start-ups and health organisations – are developing innovative mobile apps to address the problem of healthcare accessibility. Some of these apps transform connected devices into portals for clinical care, allowing patients to communicate virtually with clinicians and receive health advice from home.

Affordable, quality healthcare is not always readily within reach for many Southeast Asians. In some developing economies within the region with remote, hard-to-reach geographies, treatable infectious diseases like malaria and dengue continue to needlessly claim lives in the absence of the most basic healthcare services.

With telehealth apps, consumer can get the healthcare that they need anytime, anywhere. By taking the wait out of visiting a doctor, and streamling the consultation process, telehealth apps save time and costs for everyone[12].

Ring.MD, a Singapore-based telehealth startup that recently received fresh funding to grow its regional footprint, is one such example. An innovative online platform that allows patients to connect with expert doctors by video or phone, Ring.MD enables consumers to easily find a doctor for their needs, and schedule a call in just a few minutes – all at an affordable cost[14]. Other telehealth applications that focus on local markets include Indonesia's Dokita and Dokter Gratis.

For people who require long-term care, particularly those with chronic diseases, there are also smart home monitoring systems. These systems have the ability to monitor a range of indicators including blood sugar ratios in diabetics, international normalised ratios for patients on anticoagulant medicines, white cell counts for chemotherapy patients, or even telemetry for those with cardiac diseases. The results are then transferred electronically to the patient's primary care provider and stored in the patient's personal medical data e-docket. Additionally, the system could provide alerts to inform the patient and his or her caregiver to take specific actions[15].

While gaining popularity in developed markets such as North America, telehealth and smart home monitoring systems continue to face issues in certain areas of Southeast Asia where bandwidth constraints, low smartphone penetration and lack of experience with digital services continue to inhibit their adoption[16].

App-ic Battle

Perhaps due to its massive traffic congestion in urban areas as well as other access issues, telehealth applications and websites are taking off in Indonesia. Here are three players to watch.

Dokita

Its name derived from the phrase "dokter kita", meaning "our doctor", Dokita provides users with health advice from doctors who are on stand-by in periods of 30 minutes to an hour on weekdays from 9am to 5pm. Under certain circumstances, the doctors are also able to give recommendations for medicines or prescriptions when asked by users. Dokita currently has about 10 doctors and 100 active users[17].

Doktor Gratis

Working in shifts, Doktor Gratis currently has about 12 general practitioners responding to chats on a daily basis. The app has been downloaded about 130,000 times, with about 500 chats occurring each day[18].

MeetDoctor

MeetDoctor features online health consultation, medical articles, as well as a health services directory. A team of doctors are available to answer questions posed by members, although other members can share their views too. In addition, members can look up hundreds of articles which have all been reviewed by doctors, and locate nearby hospitals, clinics and other health institutions. MeetDoctor also has plans to launch online private consultation services with the use of a virtual chatroom[19].

13   Southeast Asia's Health App Explosion. Forbes. 15 October 2014. http://www.forbes.com/sites/techonomy/2014/10/15/southeast-asias-health-app-explosion/
14   RingMD. https://www.ring.md/
15   Integrating Healthcare, Empowering Patients. Infocomm Development Authority of Singapore. https://www.ida.gov.sg/~/media/Files/Archive/Collaboration%20Opportunities/Collaboration%20Opportunities_Level2/iN2015Healthcare.pdf
16   Southeast Asia's Health App Explosion. Forbes. 15 October 2014. http://www.forbes.com/sites/techonomy/2014/10/15/southeast-asias-health-app-explosion/
17   Indonesian Healthcare Startup 'Aibilities' Has Big Ideas. Tech in Asia. 24 July 2012. https://www.techinasia.com/indonesian-aibilities-new-stats/
18   Dokter Gratis Offers Live Health Consultation with Doctors in Indonesia. Tech in Asia. 2 May 2013. https://www.techinasia.com/dokter-gratis/
19   How an Indonesian Web Service Helps You Avoid Doctor's Waiting Rooms. Tech in Asia. 7 November 2011. https://www.techinasia.com/meetdoctor/

Hospital

With rapid advances in medical knowledge comes greater specialisation of healthcare professionals. It is not uncommon for patients, particularly those with chronic diseases, to suffer from multiple medical conditions and to be under the care of several doctors from different disciplines all at once, each prescribing a different set of medications. Healthcare providers will need to embrace new technologies that integrate clinical information to provide a seamless patient experience.

In today's healthcare system, there are currently few or no links among doctors from different specialties. Further, there is no central database containing all of the patient's medical records. As a result, no one doctor has a proper overview of a patient's health, greatly increasing the potential for poly-pharmacy and adverse drug interactions. The picture becomes even more complex as patients move across borders.

As healthcare continues to evolve into a consumer-driven space where patients want to be more involved in their care, spend less time in the waiting room or have the ability to email or text questions related to their care, it is now essential for doctors and hospitals to embrace technology to integrate clinical information and coordinate patient care.

In the Philippines, Globe HealthCloud has been developed as a patient-centric electronic medical record system that connects various stakeholders in the healthcare system and increases operational efficiency while improving the quality of patient care. The system has similar functionality to Dropbox and Google, enabling doctors, patients and health maintenance organisations to store their data on the cloud[20].

Doctors in Singapore, too, have started using the National Electronic Health Records (NEHR), a system which gives every consumer a single medical record accessible to healthcare professionals, whether in a hospital or general practitioner clinic[21]. The electronic medical record system not only allows for better, personalised healthcare – it can also uncover unexpected insights with health analytics.

Through a healthcare pilot programme in 2011, the Khoo Teck Puat Hospital in Singapore discovered that 20 percent of people admitted to the wards contributed to 80 percent of repeats, and only 10 percent of the cases were actually health related – the majority were social issues. In response, it then tailored in-home healthcare plans aimed at cutting hospital admissions. 400 patients were placed under the programme and the average admission rate fell from 3.5 times in six months to 1.3[22].

Building on this initial success, the Khoo Teck Puat Hospital extended its mining of patient information in the community to a larger programme. Screening 4,000 people in northern Singapore, aged 40 years and above, for conditions such as high cholesterol and diabetes, it then employed geospatial data technology to plot the patients on an area map to identify where more unhealthy members of the community lived. This allowed the team to implement proactive solutions such as community pop-up clinics and health and wellbeing talks in strategically positioned locations to reach those deemed at risk[23].

One Patient, One Health Record

Singapore's National Electronic Health Records (NEHR) is a data exchange system that stores the medical record of every person in Singapore who has seen a doctor in the public healthcare system since February 2011.

Through the NEHR, doctors have access to the medical history of patients to support them in decision-making. The goal of the NEHR is to ensure a seamless healthcare experience for each patient.

The NEHR is a key enabler of Singapore's strategic vision: "One Patient, One Health Record", a vision that focuses on providing customised and convenient care to patients. By providing a consolidated view of a patient's medical history, the NEHR ensures that healthcare professionals have the necessary information to help them make the best care decisions for the patient.

Information in the NEHR includes: admission and visit history; hospital inpatient discharge summaries; laboratory results; radiology results; medication history; history of past operations; allergies and adverse drug reactions; and immunisations[24].

20   The Philippine's healthcare ecosystem still lags, Philippine telco Globe wants to help. Tech in Asia. 14 October 2013. https://www.techinasia.com/philippines-healthcare-ecosystem-lags-philippine-telco-globe/

21   Docs Can Now Access National e-record System. Healthxchange. 6 February 2012. http://www.healthxchange.com.sg/News/Pages/Doctors-Can-Now-Access-National-e-record-System.aspx

22   How Big Data can drive patient behaviour change. Singapore Economic Development Board. 3 February 2015. https://www.edb.gov.sg/content/edb/en/news-and-events/news/singapore-business-news/Feature/how-big-data-can-drive-patient-behaviour-change.html

23   How Big Data can drive patient behaviour change. Singapore Economic Development Board. 3 February 2015. https://www.edb.gov.sg/content/edb/en/news-and-events/news/singapore-business-news/Feature/how-big-data-can-drive-patient-behaviour-change.html

24   National Electronic Health Record Singapore. Ministry of Health. https://www.moh.gov.sg/content/dam/moh_web/Publications/Information%20Papers/2014/NEHR/English%20Brochure%20(Final).jpg

The Health Hub ecosystem

The hallmark of the Health Hub is an open and transparent ecosystem that delivers dramatic improvements in quality and efficiency. Every stakeholder can benefit, not only from the health outcomes, but also from the opportunities for growth and innovation generated from the continual efforts invested in enhancing these outcomes..

Process standardisation

With the introduction of electronic health records, citizens' electronic personal health records and other pharmacy systems, there is likely to be greater development and standardisation of clinical operations. This advancement will pave the way for high-value care, efficient operations, as well as effective management and governance. Furthermore, healthcare professionals can utilise the health data to support alternative clinical trial designs in real-world settings, compare multiple conditions and treatment options, and track longer-term outcomes across multiple user groups[25].

Personalised care

As healthcare processes become more standardised, doctors will be better equipped to provide personalised patient care. With personal health records, augmented by cost-effective screening that can be carried out in the home but with the results read remotely, health providers will be able to tailor their diagnosis and care based on the patient's medical history, profile and other factors. Over time, the personalised prevention care and treatment can help create and maintain a healthier population, possibly at a lower cost.

Figure 3: The future healthcare ecosystem
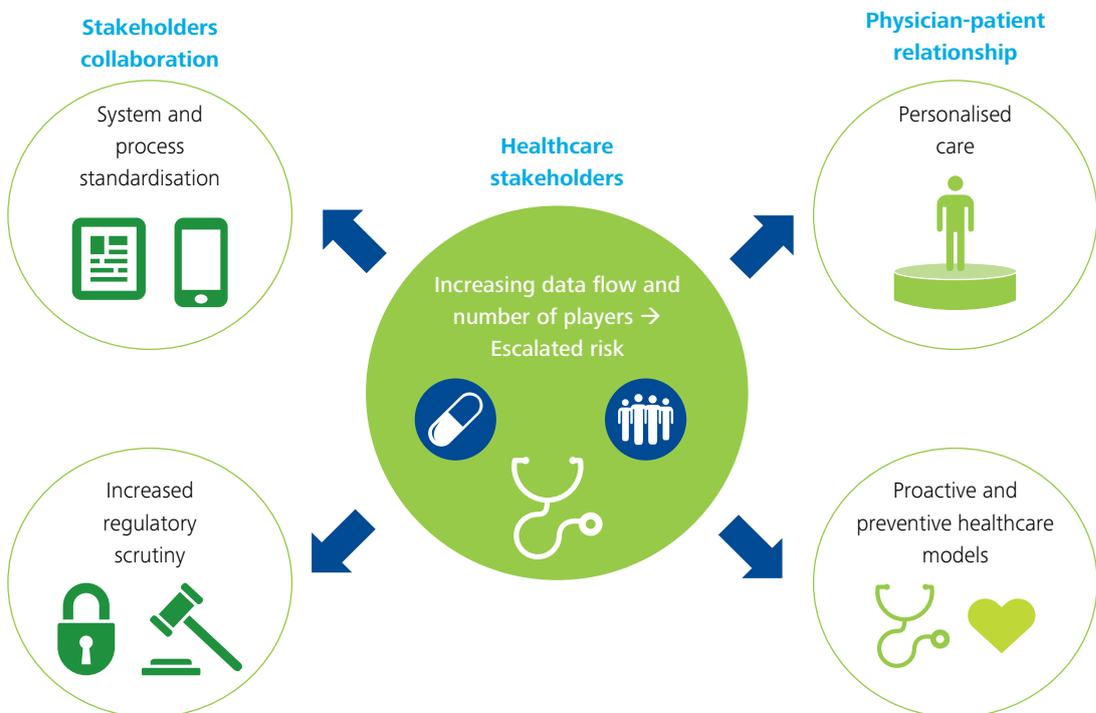
25   Healthcare 2015 and care delivery. IBM Global Business Services. http://www-03.ibm.com/industries/ca/fr/healthcare/files/Healthcare_2015_and_Care_Delivery_final.pdf

Greater collaboration amongst stakeholders

The collaboration and interaction between the Health Hub players extend to more than just the Human, Home and Hospital. In fact, pharmaceutical and medical device companies can leverage this partnership to generate new drug compounds and develop drugs that are targeted and individualised for the population. The presence of well-defined populations and sub-populations of patients with different disease susceptibilities and medical conditions would be very useful for researchers and drug companies in carrying out clinical studies in more cost-efficient ways[26]. This would help to propagate a virtuous, self-reinforcing cycle within the system.

Collaborations within the medical community

A number of collaborations are already taking place in Southeast Asia's vibrant medical community. Here are three such examples.

mClinica

Philippines' mClinica is a mobile platform that enables drug companies to reach pharmacies on a large scale using mobile phones and provide programmes to improve patients' health. Patients, too, can take advantage of discounts on medicines from pharmacies using the platform, allowing the pharmacies and the drug companies supplying them to, in turn, boost store sales and brand awareness through promotions. As information on patients' medicine purchases is stored on mClinica's platform, it possesses a powerful database that pharmaceutical companies and their distributors, as well as pharmacies, can access in real-time[27].

InSTEDD

From its office in Phnom Penh, Cambodia, InSTEDD organises community events such as Epihack, a series of hackathons dedicated to fighting infectious diseases in remote and under-resourced Southeast Asian areas. These events bring together the healthcare ecosystem to prototype solutions for collecting, tracking, and sharing data on emerging disease pandemics[28].

CommCare

CommCare is an online open-source platform that supports field workers in a range of sectors, including healthcare, to facilitate data collection, patient case management, and workforce mobilisation. The platform has been deployed in more than 40 countries, including Indonesia, Lao PDR, Myanmar and Thailand[29].

26   Integrating Healthcare, Empowering Patients. Infocomm Development Authority of Singapore. https://www.ida.gov.sg/~/media/Files/Archive/Collabo
     ration%20Opportunities/Collaboration%20Opportunities_Level2/iN2015Healthcare.pdf
27   Backers including 500 Startups fund Philippine mobile healthcare startup. Tech in Asia. 22 October 2014. https://www.techinasia.com/mclinica-philip
     pines-raises-funds/
28   Southeast Asia's Health App Explosion. Forbes. 15 October 2014. http://www.forbes.com/sites/techonomy/2014/10/15/southeast-asias-health-app-
     explosion/
29   Southeast Asia's Health App Explosion. Forbes. 15 October 2014. http://www.forbes.com/sites/techonomy/2014/10/15/southeast-asias-health-app-
     explosion/
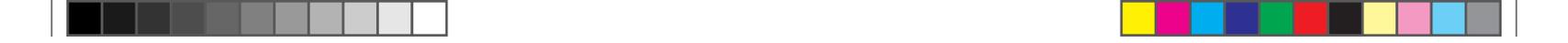
Looking forward

To enable the healthcare system to transform from one that is reactive and focused on administering treatments during times of need, to one that is proactive and focused on disease prevention, healthcare providers will need to go beyond the episodic touch points of traditional interfaces and develop an end-to-end view of their health consumer. The Health Hub presents our vision of the healthcare ecosystem that will enable this future.

While ambitious, it is nevertheless within reach given the current momentum and trajectory of the driving forces and technological development. There remain, however, a number of outstanding issues that will need to be addressed in order to ensure a smooth transition from today to tomorrow.

Interoperability standards

To facilitate the flow of electronic health information across the entire ecosystem, standards and mechanisms for the exchange must first be put in place to enable and secure this flow. These standards should not only be congruent within a local healthcare system but, in the long-run, also internationally as patients increasingly cross borders for medical treatments.

Privacy and cyber security

While an open ecosystem that enables collaboration between multiple parties will indisputably require the sharing of personal and confidential medical information between relevant parties, there remains the need for appropriate privacy and cyber security standards. With the use of data access protocols and controls, the system should enable the user to exercise control over which information is being shared, and with whom. Earning the necessary trust and confidence in the ecosystem will be crucial to ensuring its widespread usage and longevity.

Regulatory framework

With the increasing use of telemedicine, there will be a need to address physician liability and medico-legal issues, particularly in cases when clinicians prescribe treatment remotely through applications without physically examining the patient[30]. Policies are also needed to address legal issues that currently impede the sharing of medical information and use of genetic information. These could include data privacy, protection and confidentiality.

30   Integrating Healthcare, Empowering Patients. Infocomm Development Authority of Singapore. https://www.ida.gov.sg/~/media/Files/Archive/
     Collaboration%20Opportunities/Collaboration%20Opportunities_Level2/iN2015Healthcare.pdf
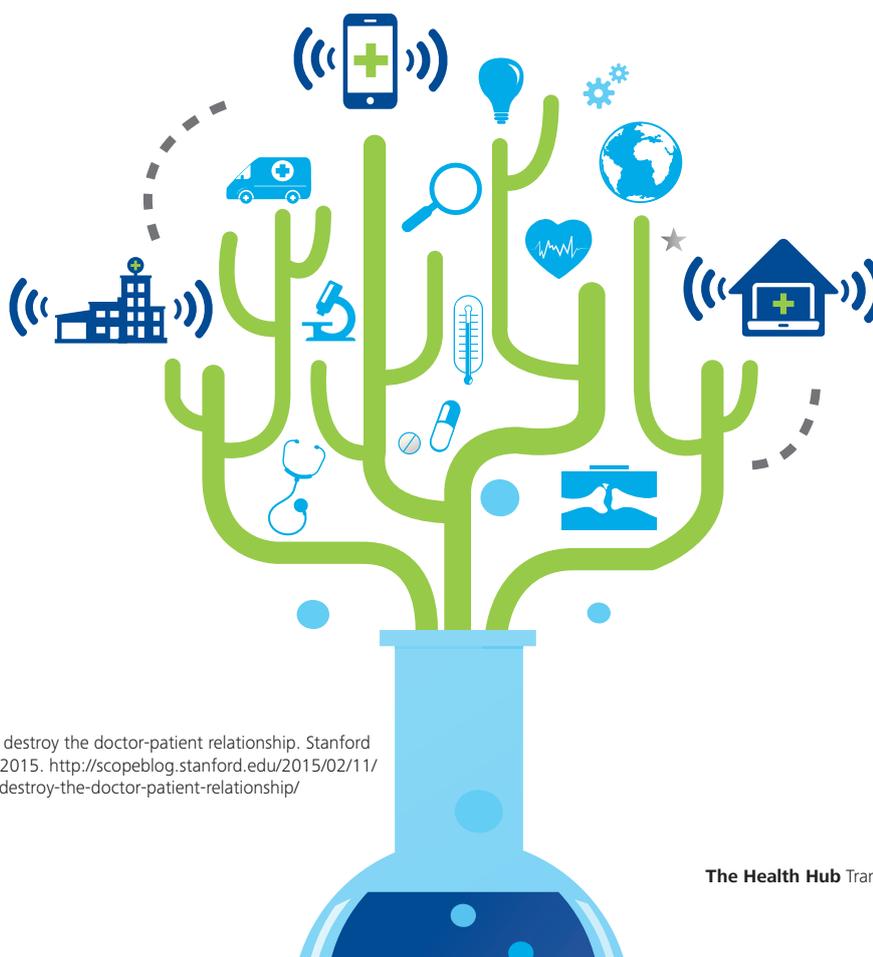
Physician-patient relationship

As patients increasingly utilise telemedicine and take on more active roles in their own healthcare, for instance, by monitoring their own vital signs with the use of wearables, there may be some concern that this will be to the detriment of the traditional physician-patient relationship and interaction.

Yet there might also be reasons to believe that such technology may actually improve the physician-patient relationship. Rather than replace the physician, these new tools create physician-patient relationships where there was none to begin with; for example, in areas where access to healthcare is an issue. In addition, these tools enable patients to handle their minor complaints outside the physician's office, enabling doctors to spend more time with patients who need more help and better cultivate physician-patient relationships where it matters the most[31].

The medical practice has benefited tremendously from technological advancement over a relatively short time span in the last 100 years, in comparison to the overall period of human discovery and scientific advancement. Yet, relatively speaking, the healthcare operating model has remained largely the same during the past century; very much resistant to change – for various reasons.

In light of the maturity of today's mainstream technology coupled with present day and predicted future health challenges, it is not too far-fetched to say that the time for an innovative healthcare approach is nigh. Traditional tried and tested approaches will not be able to efficiently deliver the desired outcomes or keep up with the exponential demand for health services. By leveraging the components of the Health Hub, new healthcare business and operating models will need to be developed to bring about the much needed disruptive transformation for the new healthcare landscape.

31   Why technology won't destroy the doctor-patient relationship. Stanford Medicine. 11 February 2015. http://scopeblog.stanford.edu/2015/02/11/why-technology-wont-destroy-the-doctor-patient-relationship/

Find out more

Southeast Asia Life Sciences and Healthcare Practice

Southeast Asia and Singapore
Mohit Grover
+65 6531 5207
mogrover@deloitte.com

Guam
Lee Vensel
+1 671 646 3884
lvensel@deloitte.com

Indonesia
Steve Aditya
+62 21 2992 3100
staditya@deloitte.com

Malaysia
Mohit Grover
+65 6531 5207
mogrover@deloitte.com

Philippines
Marites Buenaventura
+63 2 581 9000
mblandicho@deloitte.com

Thailand
Mark Kuratana
+66 2 676 5700 ext. 11385
mkuratana@deloitte.com

Vietnam
Phong Le
+84 8 3910 0751 ext. 7125
phongle@deloitte.com

Audit
Sanjay Panjabi
+65 6216 3142
spanjabi@deloitte.com

Consulting
Lee Chew Chiat
+65 6535 0220
chewlee@deloitte.com

Sachin Shah
+65 6232 7400
sachinvshah@deloitte.com

Enterprise Risk Services
Mohit Grover
+65 6531 5207
mogrover@deloitte.com

Financial Advisory
Heath Snyder
+65 6216 3308
hsnyder@deloitte.com