

# Thought Leadership Unit



## **Personalised and protected:** Health and wellness for the globally mobile

**Dr Sneh Khemka**, Vice President,  
Population Health Solutions and vHealth by Aetna, Aetna International

**Alan Payne**, Chief Information Officer, Aetna International

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# Contents

<b>3</b>	<b>About this paper</b>
<b>4</b>	<b>Summary</b>
<b>5</b>	<b>Introduction</b>
<b>6</b>	<b>Chapter 1</b>
<b>13</b>	<b>Chapter 2</b>
<b>17</b>	<b>About the authors</b>
<b>18</b>	<b>About Aetna International</b>

# About this paper

At Aetna International, it's our mission to reshape health care across the globe by developing solutions to improve the quality, affordability and accessibility of care. To this end, we take a two-pronged approach: raising awareness of critical health and industry challenges facing the world and promoting effective, value-based care solutions that could help others combat and prevent the worsening of some of the world's most serious health care problems.

# Summary

In this paper, we examine the impact big data could have on the delivery of quality health care ...

From vital signs to MRI results, patient records are awash in data. Even a simple blood test can yield dozens of important data points. And then there's the data gathered from health apps and assessments and wearable fitness devices. But accessing, analysing and using that data can be difficult when the information is spread across disparate databases.

An obvious solution would be to create a single digital environment in which an individual's health and personal data could be securely stored. This would provide a 360° view of the person's health, enabling personalised health care solutions and ultimately driving down utilisation and costs.

But questions inevitably arise. Who would pay for such a solution? Would their motivation be wholly altruistic? How would the data be safeguarded and still made easily accessible to authorised users? Would care providers and individuals in developing nations have the technology required to access such a system? And would individuals who've been stung by countless data breaches in recent years trust that their data would be secure?

In this paper, we examine the impact big data could have on the delivery of quality health care and explore some of the large and small ways that impact is already being felt. While we don't answer every question, we do point to hopeful examples from around the globe.

Francis Bacon is credited with coining the term “Knowledge is power” in 1597. But in the 21st century, data is perhaps more powerful.

# Introduction

After a two-week vacation in England one recent November, Texas resident Tracie Storie arrived at her daughter’s home in Massachusetts to celebrate the Thanksgiving holiday. When an apparent kidney infection she had picked up on holiday worsened, Tracie’s daughter insisted she go to the emergency room. On arrival the 52-year-old was immediately admitted to the intensive care unit and put on a constant IV drip due to dehydration and dangerously low blood pressure. That was on a Saturday. Since Tracie couldn’t remember the numerous antibiotics she was allergic to, doctors had to take a huge risk to treat her infection — which turned out to be caused by e coli bacteria — until two days later when they could access her medical records from her doctor’s office back in Texas. She spent four nights in the hospital and later said she was lucky to be alive. <sup>1</sup>

## **Things would have been different if she had been Estonian.**

Thanks to an e-health system Estonia put into place in 2008, the tiny Baltic nation (population 1.3 million) is at the forefront of digital medicine. Had Tracie lived there, doctors at the emergency room could have scanned her national ID card and immediately accessed her complete health record, including care summaries, referrals, vaccinations and — most critically in her case — drug allergies, all without relying on their very ill patient’s memory. They could have started treatment without waiting for her doctor’s office to open two days later, and they could have ordered tests or treatments that would automatically be added to her health record. In fact, if Tracie were to go to her primary care physician for a follow-up visit the next week, everything about her emergency care would already appear online, allowing her doctor to read the details of what had happened. She herself would be able to review her health record whenever she wished, see exactly who had accessed her data and determine what information could be shared with her doctor, other health care providers or, in anonymised form, medical researchers. If she required an additional prescription, she or a designated third party could pick it up at any pharmacy in the country without having to submit an illegibly scrawled prescription slip at the counter.

Francis Bacon is credited with coining the term “Knowledge is power” in 1597. But in the 21st century, data is perhaps more powerful. As Estonia has shown — and as other nations are discovering — health care systems that collect, analyse and share data effectively are getting the right care to the right people at the right time, improving outcomes while reducing wasteful spending. In this paper, we’ll explore the potential — and the pitfalls — of this new approach. <sup>2</sup>

<sup>1</sup> <https://www.sepsis.org/faces/tracie-storie/>

<sup>2</sup> <https://www.monticello.org/site/jefferson/knowledge-power-quotation>

# Chapter I

Data is transforming health care at the same time it's transforming every other aspect of modern society.

## The power of digitalisation

Data is transforming health care at the same time it's transforming every other aspect of modern society. Klaus Schwab, founder and executive chairman of the World Economic Forum, argues that we are in the midst of what he terms the Fourth Industrial Revolution, which he says is characterised by "a fusion of technologies that is blurring the lines between the physical, digital and biological spheres." (By Schwab's reckoning the first industrial revolution involved mechanised production using water and steam, the second involved mass production using electricity and the third involved automated production using electronics and information technology.)<sup>3</sup>

At the same time, according to EY, "the health services landscape is in the midst of a massive shift as the seamless sharing of data creates more demanding customers and opportunities for more connected, precise medicine." Specifically, EY sees four developments: 1) a shift from uninformed patients, payers and providers to "super consumers," 2) a shift from sick care to health care, 3) a shift from blockbuster drugs to precision medicine and 4) a shift from disconnected to connected health care.<sup>4</sup>

The Estonian experience demonstrates the power inherent in that last shift. Today, 95 percent of Estonian health data is digitised, 99 percent of prescriptions are raised online and 100 percent of health care bills are transmitted electronically. All told, the country's health information system holds more than 20 million health documents, including case summaries, referrals, vaccinations and digital images.<sup>5,6</sup>

And that's just the beginning. Estonia's health information system is fully integrated with the country's many other online services, which include everything from e-voting to online business registration. For example, people renewing their driver's licenses no longer have to visit a government office with a required medical certificate. Instead, this process — indeed, the whole license-renewal process — can be handled electronically. Not surprisingly, the European Commission calls Estonia "the champion in Europe in the online provision of public services."<sup>7,8</sup>

3 Schwab, Klaus. The Fourth Industrial Revolution. Crown Business, 2016.

4 <https://betterworkingworld.ey.com/digital/when-the-human-body-is-the-biggest-data-platform-who-will-capture-value>

5 <https://e-estonia.com/solutions/healthcare/e-health-record/>

6 <https://www.eu2017.ee/sites/default/files/2017-07/E-health%20factsheet.pdf>

7 <https://e-estonia.com/e-health-estonian-digital-solutions-for-europe/>

8 <https://ec.europa.eu/digital-single-market/en/scoreboard/estonia>

“Interoperability and usefulness of data and turning numbers into useful actions for consumers is key.”

It’s easy to be distracted by the technology Estonia uses, from chip-embedded national ID cards to the X-Road data exchange platform that connects disparate databases, portals and applications. But Madis Tiik, M.D., one of the founders of the Estonian eHealth Foundation, has put the technology into context. “We don’t have to focus on the digitisation or the technology — we have to focus on the services, what these technologies can provide and how these services can be beneficial for health care providers, to society and to the user or patient,” he said in an interview with British health care journal HSJ.<sup>9</sup>

Tiik’s own experience is a good example. Although he currently works as a senior advisor to Sitra, the Finnish Innovation Fund, he still maintains a medical practice 200 kilometres and two ferry trips away on Estonia’s Vormsi Island. He sees patients in person once a week, but, as Life in Estonia magazine explained, “at other times, he uses Skype to interact with the nurse at his office, renew prescriptions and give consultations.”<sup>10,11</sup>

### Catering to consumers

Capabilities like those are especially important for the expatriates and global mobile individuals, such as those Aetna International serves. But several challenges must be overcome to create an interoperable digital platform that can serve as a repository for health data and deliver access to personalised, quality care.

“Interoperability and usefulness of data and turning numbers into useful actions for consumers is key,” says Susan Garfield, Principal, Commercial Lead, Advisory Life Sciences Sector, EY. “For example, if we’re talking about the results of kidney testing, a BUN (blood urea nitrogen) level of 80 doesn’t mean a lot to most people. However, if it’s colour coded amber or red, it’s at least getting people to think about whether there’s a problem and to engage with care solutions that are focused on the best possible health outcomes.”

Garfield also sees turf battles as a barrier. “It also seems as though some players really want to keep their data and not share it with consumers, or with other stakeholders,” she says. “Then there’s data leakage, which not only puts consumers at risk but also keeps people from sharing data, which feeds into the issue of interoperability.”

The emphasis must increasingly be placed linking individuals’ touch points together to provide accurate medical information about the patient, resulting in bespoke, high-quality health care solutions. Providers must also use digital technology to deliver the on-demand services people expect, such as virtual care, which is available at any time of day or night anywhere in the world.

<sup>9</sup> <https://e-estonia.com/solutions/interoperability-services/x-road/>

<sup>10</sup> <https://www.linkedin.com/in/madistiik/>

<sup>11</sup> [https://issuu.com/eas-estonia/docs/lie\\_summer2013](https://issuu.com/eas-estonia/docs/lie_summer2013)

It's no surprise that individuals increasingly consider themselves to be active consumers instead of passive patients.

"Giving people — no matter where they live — access to personalised health care means giving them choices and the support they need to prevent illness and focus on achieving their optimum health rather than just reacting to illness if and when it happens," says Dr Sneha Khemka, Vice President, Population Health Solutions and vHealth by Aetna, Aetna International. "That's just what we're doing at Aetna. We're moving from a sick care model to a true health care system that keeps people well for longer."

The key is to take a holistic view of an individual's health — where they live, their family history, their health data, their lifestyle and circumstances — coupling that with their health goals to provide personalised prevention, early intervention and condition management. At Aetna International, our goal is to help the 50 percent of people who are classified as healthy (and who account for just 6 percent of health care costs) stay healthy, while providing personalised support to those who have a medical condition or are ill. "The health care sector considers the people that go through its systems as patients; the insurance industry refers to them as customers or members," says Alan Payne, Chief Information Officer (CIO), Aetna International. "My view is that anyone who uses a health care product, whether an insurance product or a visit to a hospital, is a consumer. And the more the industry puts the consumer at the heart of everything we do, the better their experience."

This sentiment is echoed by Dr Dan Knecht, Vice President, Clinical Strategy & Policy, Aetna. "I use the term patient all the time, but I think it puts up barriers because then it's like a binary relationship between clinician and an individual with a condition," he says. "I think going forward, there is a real opportunity — with building an interoperable digital health care ecosystem — to remove the word patient and use the term health care consumer, which is really more inclusive."

### Consumer demands

It's no surprise that individuals increasingly consider themselves to be active consumers instead of passive patients. They like how technology has transformed shopping and banking, and they want similar service from the health care system. They also wonder why, as one health start-up CEO puts it, "why the health care industry still requires them to do the same transactions the same way they've been doing them for the last 40 years." Deloitte's 2016 Consumer Priorities in Health Care Survey describes consumers' attitudes this way: "As a result, they are demanding greater personalization; transparency in network coverage, medical prices and bills; convenience; and more engaging digital experiences and capabilities. From doctor's appointments to lab visits and even hospitalizations, consumers seek high quality service tailored to their specific needs from health care providers and administrative staff."<sup>12,13</sup>

<sup>12</sup> <https://betterworkingworld.ey.com/digital/when-the-human-body-is-the-biggest-data-platform-who-will-capture-value>

<sup>13</sup> <http://www.modernhealthcare.com/article/20170127/SPONSORED/170129913>



The explosion in popularity of wearable devices like Fitbit fitness trackers has introduced millions of people to the potential health benefits of biometric devices.

They are also increasingly willing to collect data about themselves. The explosion in popularity of wearable devices like Fitbit fitness trackers has introduced millions of people to the potential health benefits of biometric devices. “The gamification of physical activity and competitiveness on a social level is very powerful for younger people — and it’s all designed to improve outcomes,” says Dr Khemka.

This consumer data has intrinsic value. However, in many cases, the consumers aren’t receiving any of that value. As Dr Knecht says, “They actually don’t own their own data per se. They often have often to go through many, many hoops to access their own data. There’s another part of this equation, which is how do we help patients leverage the value of their own data and experience? And how can we create systems that reward them for sharing and putting their data into communal settings but also reap the rewards from that?”

Unfortunately, most of the data collected by wearables never makes it to the doctor’s office. As the IBM Institute for Business Value notes, “The torrents of data gathered by wearable devices to track an individual’s health is streaming to the cloud and our smartphones, but rarely landing in a physician’s hands. Much of this patient-generated health data (PGHD) is going nowhere — sometimes not even to the patient. Even the data generated by at-home devices and transmitted to physicians is frequently not stored.”<sup>14</sup>

As wearables and other biometric devices become more sophisticated, they can gather far more valuable data than the number of steps a person has taken. For example, Fitbit’s Ionic smartwatch includes a blood-oxygen sensor that could potentially detect sleep apnoea and heart arrhythmia. Pending approval by the U.S. Food and Drug Administration, the device could replace expensive and uncomfortable chest patches for some patients. As Fitbit CEO James Park told Wired magazine, “The FDA recognizes that there is this potentially new class of devices that’s not a consumer device and not a traditional medical device, but somewhere in between, and that there needs to be a new regulatory pathway.”<sup>15</sup>

<sup>14</sup> <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=GBE03790USEN>

<sup>15</sup> <https://www.wired.com/story/when-your-activity-tracker-becomes-a-personal-medical-device/>

Wearables also seem to be encouraging consumers to share their health data — at least anonymously.

Wearables also seem to be encouraging consumers to share their health data — at least anonymously. According to the Intel Healthcare Innovation Barometer, 84 percent of people would share results of blood-pressure screenings and lab tests, 75 percent would share information from an ingestible monitor and 70 percent would even share information collected from a “smart toilet,” one version of which, as an Israeli start-up explains, “works by continuously monitoring stool as it is being passed and the information is forwarded to the mobile app, in the form of actionable insights based on the underlying chemical and physical composition.”<sup>16,17</sup>

While Aetna International isn’t tracking data from smart toilets, we are harnessing technology to better serve members. The organisation’s digital agenda helps ensure that consumers are triaged from digital support, through to consultations over the telephone and through mediums such as Skype, and then on to physical care. Providing a digital platform that enables health care professionals to quickly move the consumer to the support that precisely matches their needs underlines the incredible power and potential of even larger interoperable digital health care environments. The benefit to the individual? Consumers are reaping the benefit from a sizeable investment in preventative care, helping them to stay healthy and lowering costs. And the benefit for the insurance company and health care providers? The trust and loyalty of healthier consumers who cost less to look after.

“At Aetna International, we use connected technology and clinical algorithms to identify who our sickest members are today, and we use predictive modelling to identify who our sickest members will be tomorrow,” says Dr Khemka. “Mining both personal and anonymised population data, we can create meaningful, actionable and personalised strategies to help keep people well. We provide access to quality health care — locally and virtually — focussing on health outcomes while containing costs and keeping premiums in check.”

<sup>16</sup> <https://www.intel.com/content/www/us/en/healthcare-it/solutions/documents/healthcare-innovation-barometer-infographic.html>

<sup>17</sup> <http://www.techweez.com/2017/07/06/israel-startup-outsense-poop-scanner/>

“Today, organisations can collect vast amounts of data, but insights cannot be drawn if they lack the technical expertise to interpret it or proper tools to analyse it.”

## Putting big data and long data to work

Skype consultations and e-prescribing increase convenience for consumers and providers alike, but that’s immaterial if they don’t improve outcomes, which is where the real power of harnessing data lies. And there’s plenty of data available, as two examples indicate.

First, consider the information available to doctors on clinical advances and new drugs and technologies. Virtually all physicians say that reading medical journals is important to their practices, and 16 percent say something they read helped save the life of a patient in the last year. Yet the American Medical Library Association reports that more than 7,000 articles are published each month in primary-care journals alone. “Medicine has a TL;DR problem (Too Long; Didn’t Read),” says Nate Gross, MD, co-founder of Doximity, which aggregates journal content for its subscribers. “It would take 20 hours of reading each day for the average physician to comb through everything published in their speciality.”<sup>18</sup>

Second, consider the information collected by doctors, hospitals, diagnostic centres and other players. According to Stanford Medicine’s 2017 Health Trends Report, “the sheer volume of health care data is growing at an astronomical rate: 153 exabytes (one exabyte = one billion gigabytes) were produced in 2013 and an estimated 2,314 exabytes will be produced in 2020, translating to an overall rate of increase of at least 48 percent annually.”<sup>19</sup>

“More data has been created in the past two years than in all previous years combined,” says Aetna International’s Alan Payne. “Humans can’t comprehend this level of data, and this has driven innovations like cognitive computing and artificial intelligence.”

As Stanford Medicine’s 2017 Health Trends Report notes, “Today, organisations can collect vast amounts of data, but insights cannot be drawn if they lack the technical expertise to interpret it or proper tools to analyse it.” With that expertise and those tools, however, doctors and hospitals could revolutionise the care they provide. (The report also points out that the “best job” in America is data scientist, followed closely by data engineer at #3 and analytics manager at #5.)<sup>20</sup>

18 <https://www.businesswire.com/news/home/20140722005535/en/Survey-Doctors-Read-Means-Patients>

19 <https://med.stanford.edu/content/dam/sm/sm-news/documents/StanfordMedicineHealthTrendsWhitePaper2017.pdf>

20 <https://med.stanford.edu/content/dam/sm/sm-news/documents/StanfordMedicineHealthTrendsWhitePaper2017.pdf>

Big data can help identify important trends on the population level.

Big data can help identify important trends on the population level. For example, a study of more than two million tweets related to H1N1 flu in 2009 found a close correlation with incidence data, pointing toward a future when near real-time analysis of such “infodemiology” data could be used to monitor disease outbreaks.<sup>21</sup>

But just as important on the individual level is “long data” — short for longitudinal data. In health care terms, that means an individual’s complete medical history. As the IBM Institute for Business Value has asked, “How valuable would it be to have the full history of an individual’s health? What if every vital sign that has been recorded, all of the medicines taken, information associated with every doctor’s visit, illness, operation and more could be efficiently and accurately captured? The quality and coordination of care would be expected to rise, and the costs and risks likely to fall.” In fact, in a review of big-data initiatives, McKinsey and Company predicted the potential bottom-line impact: “If these early successes were scaled up to create system-wide impact, we estimate that the pathways could account for \$300 billion to \$450 billion in reduced health-care spending, or 12 to 17 percent of the \$2.6 trillion baseline in U.S. health-care costs. Given that health care represents nearly 18 percent of U.S. gross domestic product, that would result in a huge economic impact.”<sup>22,23</sup>

21 <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0014118>

22 <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=GBE03790USEN>

23 <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/the-big-data-revolution-in-us-health-care>

# Chapter 2

## Data security and the General Data Protection Regulation

Keeping sensitive personal data secure lies at the heart of the European Union's General Data Protection Regulation (GDPR), which went into effect on May 2018. Replacing the old and outdated Data Protection Directive, this new regulation applies to all businesses that operate within the 28 EU member states or process data on EU citizens. It mandates that all data that relates to a living individual be protected, including name, address, email address, identification card number and — most significantly in a health care environment — health and genetic data.<sup>27</sup>

### Data security

In a recent white paper, Ernest & Young posed a provocative question: "When the human body is the biggest data platform, who will capture value?" Some would argue that thieves and scammers would like to move to the front of the line. While it would be easier to monetise someone's bank account number than their blood pressure numbers, there's no doubt that data security is incredibly important.

As mentioned earlier, Estonian citizens can see who has accessed their data in the past and control future access. (It should be noted that health officials say only 500 or so people have completely blocked access to their records.) But that's just the beginning. Data in the Estonian National Health Information System is protected in a few other ways. Citizens have digital ID cards that use two-factor authentication, the system maintains a log of all activity and record can only be added to, not changed. Moreover, all data is sent through secure channels, according to Artur Novek, an implementation manager and architect at the Estonian eHealth Foundation. "For example, if a doctor sends information through a well-known protocol, the information is encrypted from one security server to the next. We use centrally matched certificates to identify the individual or organisation that sends the information. The certificate provides knowledge about a local system. It is mandatory for these hospitals to use this secure server. This allows us to identify external individuals who have no right to access the data," he says.<sup>24,25,26</sup>

Ongoing monitoring is also important, says Aetna International's Alan Payne. "We only give access to customer data to people who absolutely need it," he says. "We also monitor the transactional activity of customer data, and we stop it if it tries to go outside our borders. We scan every outbound and inbound transaction looking for patterns of customer data. We know that when anyone moves anything with a Social Security Number then it has a 3-dash-2-dash-4 pattern, even in a PDF. Likewise we've mapped global ID patterns — we know if there's a Singaporean ID number being sent."

24 <https://www.eu2017.ee/news/press-releases/estonias-unique-e-health-thousands-data-fields-one-personal-health-record>

25 <https://link.springer.com/content/pdf/10.1007%2Fs12553-017-0195-1.pdf>

26 <https://accessh.org/wp-content/uploads/2015/10/Estonian-eGovernance-Case-Study.compressed.pdf>

27 <https://www.csoonline.com/article/3202771/data-protection/general-data-protection-regulation-gdpr-requirements-deadlines-and-facts.html>

When data are collected the entity collecting them must clearly inform individuals about why it is collecting the data, who else might receive them and how long they will be kept. Those individuals have the right to receive a copy of their data and the right to withdraw consent at any time.<sup>33</sup>

Aetna International has a registered office in the UK and conducts business within the European Union. As such, it is bound by the GDPR until the UK leaves the EU. Even then, the UK will likely adopt new legislation that aligns with the GDPR to allow for the free movement of data between the UK and the EU. In the meantime, Aetna International, which has a dedicated GDPR team, has worked hard to ensure that our customers, partners and members are properly protected and that we are fully compliant with the GDPR.<sup>34</sup>

## Data and the blockchain

To many experts, the holy grail of data security is blockchain technology. While it's best known as the mechanism that undergirds cyber currencies like Bitcoin, at its heart blockchain is simply a way to store data in a secure, distributed fashion. Here's how one expert, Bernard Marr, describes the technology: "Blockchains are distributed systems that log transaction records on linked blocks and store them in an encrypted digital ledger. There is not one central administrator, but it has unprecedented security benefits because records are spread across a network of replicated databases that are always in sync. Users can only update the block they have access to, and those updates get replicated across the network. All entries are time and date stamped."<sup>28</sup>

Susan Garfield explains why blockchain has great potential in the creation of digital health care platforms. "So the technology itself — without going into the detail — is a really nice way to safeguard large or small complex multiuser information," she says. "And that starts to look and feel a lot like health care, right? We have patients, we have providers, we have health systems."

Blockchain technology could enhance data security — which is incredibly important given that health data breaches occur daily — but that's just the beginning. The technology could also help connect electronic health record systems that are currently disconnected and siloed. According to one report, U.S. hospitals could save 950,000 lives and \$93 billion U.S. over a five-year period just by sharing data effectively. Moreover, the technology could simplify regulatory compliance (since blockchains create real-time, secure audit trails) and maintenance of clinical trial records. As Tapan Mehta, an executive with mobile technology and services company DMI has noted, "A majority of pharmaceutical research related to clinical trials is completely in silos, thereby making collaboration across an organization's internal team impossible. This creates crucial safety issues for patients and knowledge gaps for healthcare stakeholders and policymakers."<sup>29,30,31,32</sup>

28 <https://www.forbes.com/sites/bernardmarr/2017/11/29/this-is-why-blockchains-will-transform-healthcare/>

29 [https://cdn2.hubspot.net/hubfs/2331613/Breach\\_Barometer/2016/2016%20Year%20in%20Review/Protenus%20Breach%20Barometer-2016%20Year%20in%20Review-%20final%20version.pdf](https://cdn2.hubspot.net/hubfs/2331613/Breach_Barometer/2016/2016%20Year%20in%20Review/Protenus%20Breach%20Barometer-2016%20Year%20in%20Review-%20final%20version.pdf)

30 <http://www.healthcareitnews.com/news/data-sharing-initiative-reduces-deaths>

31 <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=GBE03790USEN>

32 <http://www.healthcareitnews.com/news/blockchain-beyond-ehrs-transforming-value-based-payment-precision-medicine-patient-centric-care>

## Counting the costs

Information may yearn to be free, as is often said, but collecting and analysing data comes at a cost. Estonia spent just \$10 US per citizen to implement its electronic health record system, but that low price was only achievable because much of the infrastructure was already in place. The UK spent £10 billion on a patient record system for the National Health Service (NHS) that it eventually abandoned.<sup>38,39</sup>

Susan Garfield, Principal, Commercial Lead, Advisory Life Sciences Sector for EY, notes that who pays the bill is an important question. “Who pays for these systems?” she asks. “Because the end benefit doesn’t necessarily go to those who invest in creating these platforms.

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## Into a digital future

All of these developments, of course, have the potential to hugely disrupt the health care system, just as digital technology has upended the music, retail, newspaper and taxi businesses. Estonia’s Madis Tiik predicts drastic change in the foreseeable future. “Doctors and nurses will have the role of doing regular check-ups, giving recommendations — and this too can be done virtually,” he says. “If used right, technology can deal with about 80 percent of health-related issues and perhaps 20 percent will remain in the domain of traditional medical care in the future.”<sup>33</sup>

Others don’t go that far, although they acknowledge that change is inevitable due to both technological innovations and an increased emphasis on value-based care. In its report “Preparing the Doctor of the Future,” the Deloitte Center for Health Solutions predicts that “the physician of the future won’t show up to work with a satchel and a stethoscope, but rather with a tablet or smartphone that fits neatly into the pocket of her white coat.... Her patients will likely receive team-based care through a holistic lens rather than care through sequential encounters that may not be consistently tied together. Prescriptions could be requested and appointments made online, and digital technology will likely allow for online check-ups and quick questions. Decision support technology will likely help her use the most up-to-date evidence-based information when evaluating the need for care and making clinical decisions.”<sup>34,35</sup>

(That future doctor may get her training at a place like the Carle Illinois College of Medicine in the United States. Planned for a summer 2018 opening, the college promises to be “the first in the world to integrate engineering principles in teaching medicine.... Balancing clinical medicine and biosciences with engineering and the humanities centers our work on the human condition.”)

33 [https://issuu.com/eas-estonia/docs/lie\\_summer2013](https://issuu.com/eas-estonia/docs/lie_summer2013)

34 <http://www.healthcareitnews.com/news/estonia-launches-10-ehr>

35 <https://www2.deloitte.com/insights/us/en/industry/health-care/doctor-of-the-future-medical-school-residency-programs.html>

36 <http://www.healthcareitnews.com/news/estonia-launches-10-ehr>

37 <https://www.theguardian.com/society/2013/sep/18/nhs-records-system-10bn>

In the case of globally mobile citizens, maybe it's their employer paying for their health insurance, maybe it's the health insurer themselves. But probably not because that person is not going to stay on the plan for very long. So the incentive to invest in these services that may be better, that may have a higher prevention orientation, is just not there. Until we align the incentives between the innovators and the payers and the consumers, you're not going to see the macro impact of the innovation that you could. We need to figure out how to align the incentives so that those who invest in the infrastructure have an incentive to do so." <sup>42</sup>

(Similarly, realising the promise of the Internet of Things has given rise to the Internet of Skills (IoS). With the IoS comes the potential for doctors and specialists to work remotely and cater to those in geographies where access to quality care is currently not only difficult, but impossible. "For example," says Susan Garfield, "you could have someone in New York City operating on someone in Bangalore — and not just watching the operation but actually doing it — because the 5G bandwidth provides enough capacity for the doctor to run the health care tools — the robots — remotely.")

Those who have studied Estonia's health system know that many of Deloitte's predictions have already come true. Moreover, the country is already planning to expand its services by linking to the Estonian Genome Center (which already has DNA data for 5 percent of the adult population), adding decision support tools and integrating social-care records with health records, among other things. Eric Lander, president of the Broad Institute of MIT and Harvard (which collaborates with the Estonian Genome Center), says, "Think of the amazing opportunities that come from combining the IT infrastructure and the public trust in it with the information that can be learned from the genome." <sup>38,39</sup>

Digital interoperable health care platforms are an emerging area. To truly realise the end goal — delivering the best health outcomes for individuals at the right price — more stakeholders will need to get involved in the conversation and claim a seat at the table. As Susan Garfield says, "Globally, more and more people are really understanding it's not just about the clinical impact, but it's a whole health, economic, quality of life trifecta."

In fact, much can be learned from the huge wealth of data now available to clinicians, data currently stored in disparate databases, voluminous medical journals, wearable devices and the brains of their colleagues. Harnessing that data could go a long way toward preventing and treating the diseases that plague humanity today.

At Aetna International, the foundation for an integrated digital health care platform that focuses on the health outcomes is in place to the benefit of our consumers. And we're moving towards bringing our care providers, partners and other stakeholders with us on our evolutionary journey.

<sup>38</sup> <https://accessh.org/wp-content/uploads/2015/10/Estonian-eGovernance-Case-Study.compressed.pdf>

<sup>39</sup> <https://www.theatlantic.com/health/archive/2015/10/is-a-biobank-system-the-future-of-personalized-medicine/409558/>

<sup>40</sup> Aetna International interview with Susan Garfield



# About the authors



## **Dr Sneh Khemka, Vice President, Population Health Solutions and vHealth by Aetna, Aetna International**

Dr Sneh Khemka, MBChB, MRCOphth, (Hon) MFPH, is the President of International Population Health Solutions at Aetna International. He is a surgeon by background, holds an honorary membership of the Faculty of Public Health, and is a key figure in international healthcare improvement.

Sneh heads Aetna International's efforts to help governments and large organisations manage the health of their populations better, primarily through infrastructure development (major Information Technology systems), clinical data analytics, health and disease management, and ultimately primary care.



## **Alan Payne, Vice President and Chief Information Officer, Aetna International**

Alan Payne is the Chief Information Officer for Aetna International. Alan is a seasoned executive-level Digital and Technology leader, a successful entrepreneur and a qualified Chartered Management Accountant, with a proven commercial track record of implementing at all sizes of organizations. His experience includes over 25 years in Insurance, Health care, Banking and Capital Markets, bringing digital innovation, vision, knowledge, drive and the ability to deliver globally across multiple businesses and support functions.

He has commercially negotiated complex contracts, and has a deep knowledge of developing sophisticated architectures and platforms to satisfy business and consumer needs in international cultures and organisations, having lived and worked on four continents. Alan holds an Honorary Professorship at the University College London Faculty of Engineering (Intelligent Systems) and has specific research interests in Digital Health, Artificial Intelligence and Entrepreneurship.

## **Special thanks to our contributors:**

**Dr Dan Knecht**, Vice President, Clinical Strategy & Policy, Aetna

**Susan Garfield**, Principal, Commercial Lead, Advisory Life Sciences Sector, EY

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Aetna International is committed to helping create a healthier global community. We offer large employers, health care systems and government entities customised technological and health management solutions to help improve health, enhance quality of care and contain costs. We provide international and national health benefits and services to more than 800,000 people worldwide, and our customers include expatriates, local nationals, the globally mobile and business travellers.

We offer comprehensive health care benefits, including medical, dental, vision and emergency medical assistance amongst others, along with preventative and condition management care programs. Aetna International's parent company, Aetna, is one of the leading health care benefits and services companies in the U.S., serving 46.5 million people with information and resources to help make better informed decisions about their health and wellness.

For more information, see [aetnainternational.com](http://aetnainternational.com) and [aetna.com](http://aetna.com), and discover how we are delivering the promise of healthy ... anytime, anywhere.



## White paper series detail

### Thought Leadership Unit production team:

**Lorien Norden**, Editor and Content Strategist, Aetna International

**David Tyers**, Senior Director, Marketing Strategy and Planning,  
Aetna International

**Richard Armstrong**, Informatics Manager, Aetna International

**Anupa Gunasekaran**, Senior Informatics Analyst, Aetna International

**Mark Ray**, Researcher and writer, [linkedin.com/in/mark-ray-a535a014](https://www.linkedin.com/in/mark-ray-a535a014)

**Lauren Somers**, copywriter, [linkedin.com/in/laurenpoundsomers](https://www.linkedin.com/in/laurenpoundsomers)

**Carol Rahill**, Design Consultant, [linkedin.com/in/carolahill](https://www.linkedin.com/in/carolahill)

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