



Digital Health – The Revolution in Health Management

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“Digital health” serves as a catchall description for the changes technology is bringing to make health and healthcare more personalised and precise. It extends to the output of wearable devices and other technology that allow self-monitoring of health status and fitness. The fast-moving development of information and communications technology is converging with advances in molecular biology and nano-technology. Patient monitoring, diagnostics and drug delivery are already handled using smart handheld or implantable devices linked up to systems by the Internet of Things.

An increasing number of people are actively using technology to generate personal health information based on their lifestyles; more than 70 million wearable devices were sold last year and the number is expected to more than double in the next five years.¹ This development has healthcare providers thinking differently about patients. For life and health insurers, it means pausing to reflect how digital health data could integrate with traditional methods used in underwriting and claims. Two parallel and quite distinct sources of medical information are evolving: the traditional medical records generated and stored by clinicians, and the new source of data created by consumers with wearables and other devices. The question is whether accessing this new digital health data is worthwhile.

Digital health

For healthcare providers, information-based medicine involves the digitalization of health records as well as decisions about individuals’ treatment and support. In many countries electronic health records can be accessed from any clinical setting. Harnessing digital health is viewed as critical to providing high-quality, sustainable health and care services.² It is hoped that digital health will combat the rising burden of chronic disease through earlier diagnosis, better treatment and reduced hospital stays.³

As health spending continues to climb, digital health may be driven by the intent to improve customer service, but the desired outcome is to have medical care provided at a lower cost. Achieving this lofty ambition will require substantial investment. A leading U.S. healthcare provider spent USD 4 billion and 10 years digitizing the health records

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of its 9 million members; scaling this up on a national scale could be ruinous.⁴

Ideally, digital health could promote greater self-empowerment as people track, manage and improve their health. Tracking is possible with a wearable device and a health app, a software application that runs on a smartphone and is synced with the device. This would mean a real-time record of day-to-day wellness could supplement data from episodic health checks and emergency clinic visits, or switch the emphasis from cure to prevention through lifestyle management – an important opportunity since 80% of premature heart disease, stroke and diabetes and 40% of cancer is preventable.⁵

The involvement of technology giants – such as Google, which created a new wearable device intended for clinical trials, drug testing and other medical-focused applications, and Apple, which created but currently has disabled the healthcare capability in the Apple Watch – shows how seriously the opportunity is being taken. Academic institutions are making serious investment in exploring how to integrate and apply these emerging technologies meaningfully and scientifically, in the pursuit of optimal wellness, vitality and preventive care.⁶

Digital health meets quantified self

The ideal of the “quantified self” is to improve health by measurement and logging of personal inputs and performance. The thirst for data has spawned a wide range of self-tracking tools that help people monitor their sleep, mood, fitness and diet, often using a smartphone as a hub.⁷ Add to it bespoke information-based medicine taken from the Internet, tele-care and social media networks, to personal genomic and biometric data – all stored and transmitted digitally – and the notions of quantified self and digital health coalesce.

Individuals are helping create a new digital store of information about their health status and a record of how it evolves. The process of adding data is continuous, quite unlike how health records have been created through occasional doctor visits or periods of hospital care.

To date, recording of vital signs – blood pressure or blood sugar levels – has normally been limited to

people who have symptoms. Health apps put monitoring into the hands of millions of asymptomatic people who are eager to become a quantified self.

While there is no evidence to suggest that health apps do harm, it is considered unlikely that they are helpful to users who are already fit and healthy.⁸ It is important, however, to ask how reliable or useful the data generated by apps can be to others. Most apps lack any basis of evidence or professional input and are not regulated for medical use. The U.S. Food and Drug Administration has indicated that any app that purports to turn a smartphone into a medical device should be regulated. Until then, data from unregulated apps could be terribly misleading. Users could rely upon software whose claim of medical accuracy is unfounded and cause them to waste doctors’ time. Inaccurate data from apps or wearables could also escalate fears of ill health, also causing increased consumption of healthcare.

On the other hand, data from wearables and devices are now being used in research. A wearables-based cardiology study is underway, for example, and seeks to explore the link between physical activity and heart disease by collecting data transmitted by fitness devices via an app.⁹ The researchers plan to enroll people worldwide to better understand cultural and geographic variables of heart disease. This new study is one of five using data from wearables to determine how physiological signs may influence the development of disease, including Parkinson’s, asthma, diabetes, and breast cancer. In theory many other medical studies could be augmented using data from wearables.

Digital health and life insurance

Some say the life insurance industry will be “severely disrupted” as more people use self-tracking and self-testing technology available from the healthcare, sports and fitness industries.¹⁰ The implication is that insurers who stick to traditional methods of evidence collection will risk being left behind as digital technology promotes changed behaviour in consumers. More positively, perhaps, insurers that successfully engage with quantified self practitioners could build a portfolio of health-conscious individuals who have improved mortality and lower levels of morbidity.

Another question is how life insurers might access the data of the quantified self. It seems likely that relevant medical data will soon reside in two locations: in digital medical records and an applicant's smartphone or cloud. These parallel records are likely to combine in the future as individuals are granted ownership of their entire personal health histories. For example, millions of Americans can already access their health records online,¹¹ and the UK government has pledged that within a year patients will have full access too and even be able to update their records with information from wearable devices.¹²

In effect this move opens a health partnership between patients and clinicians. Doctors will learn how patients' physical activity influences health, and patients will get much more ownership and control over how their health develops and is managed. Success, however, depends on the development of new and approved health apps. It also relies on people being willing to participate and being reassured about the security of their personal data. If this reassurance proves to be unconvincing, it is possible people will use devices and apps to create their own health records that will develop quite separately but in parallel to doctors' records. The doctor would continue to record details of episodic health events but individuals could potentially have much richer data based on continuous monitoring of themselves that they keep private. This separation could pose a challenge for insurers who wish to access health information relevant to risk assessment.

Access by insurers to health records via a doctor follows well-established protocols; there is no reason to assume digitalization will restrict this access in the future. However, we should not assume that insurers can simply "download" everything. The recent move to block UK insurers' access to entire patient records serves a reminder that underwriters may only receive health data that is relevant to their risk assessment.¹³

While it is understandable that people want to generate information about their current health and susceptibility to future illness, it is unclear to what extent they are prepared to share it. The success of telematics in motor insurance, which track a driver's movements, suggests fears over privacy can be surmounted if the technology

results in attractive premiums, yet the security of digital health data is surely more contentious.

Collating data from multiple devices to create anything meaningful will be challenging. The untested and unscientific data from devices and apps may be technically inferior to clinical evidence, such as blood tests or ECGs. A disparity of information between consumer and insurer raises the possibility of anti-selection, although a more informed consumer could represent a better risk.

There is also the risk of isolating customers who do not possess the technology or the skills to achieve "digital inclusion" – or the desire to follow the trend toward the quantified self. Insurance has broad appeal; wearable gadgets, however, appeal more to the early adopters or a subset of the population. Therefore, insurers need not all seek identical solutions to accommodate digital health developments at the risk of alienating the majority.

Back to the future

Insurers must first consider if this type of data is useful and how best it can be evaluated. Underwriting protocols ensure that only a small proportion of applicants need further evaluation. For insurers, a review of digital data available in quantified-self records potentially expands underwriting assessment to 100% of applicants. It is not clear if this is a desired outcome.

Nonetheless, this is only the beginning, and a further refinement of wearables and the apps that support them should be anticipated in the near future. The way people think about health, and how they find solutions to diagnose and treat illness, are changing. In turn, the way healthcare is delivered to individuals and how records are generated and stored is creating an increasingly digital health landscape.

We in the life and health insurance industry should have no doubt that the pattern of patient-doctor contact will shift if it is possible to deliver the cost savings and efficiencies in healthcare delivery demanded by governments. In the future, a personal encounter with a doctor may occur only once all digital triage options have been exhausted or when a medical crisis is emerging.

If more people opt to self-quantify, the shift could lead to medical records lacking nuances about

lifestyle that are considered so important in predicting morbidity and mortality. It could be that a report from the family doctor may yield only partial inputs useful to underwriters' risk assessments, and much important data will exist elsewhere in digital form.

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