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Health Apps—Hype or Opportunity in the Risk Management of Life and Health Insurance?

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"Is there a doctor on board?" the captain's voice inquires through the speakers. The Airbus took off from London half an hour ago and is on its way to Tokyo, when a passenger suddenly complains of acute chest pains. Fortunately, a doctor offers her help. The crew is relieved, at least for a moment. Because, instead of beginning with the treatment, the physician pulls out a smartphone. "You can't make a telephone call now!" one of the stewards blusters. But the doctor remains cool, places the smartphone on the patient's chest and analyses the ECG on its display using an app. She diagnoses a heart attack, and the captain turns the plane around immediately. When the plane lands, a rescue van is already waiting on the tarmac for the passenger, and it takes him to the nearest intensive care unit. Thanks to the rapid treatment, the passenger survives. Science fiction? No, this is already today's reality!

All kinds of information today can be collected, saved and transmitted by smartphone. That is one of the reasons why the volume of data available around the globe has increased so explosively in such a short time. Big data is what this is, and the next data explosion is already starting—triggered by digital networking in what is called the "Internet of Things" (IoT).

What are the implications of this for life and health insurance, that is, for an industry, the competence of which it is to estimate risks as accurately as possible, primarily on the basis of statistical data, and to adequately cover those risks? The following explanations endeavour to approach this highly topical question, by initially showing the extent of the rapidly accelerating data growth and then investigating the triggers and future drivers of this trend. Finally, we venture to describe a scenario for how things may develop in the future, while, of course, looking into possible risks and opportunities for life and health insurance.

Digitalisation and the disruptive power of the smartphone

The days in which data were only gathered and stored on paper are long gone. Large companies have been working with computers and storing information digitally ever since the 1970s. But although the amount of digital data being produced has continuously grown since then, 90 per cent of all the world's available digital data has been generated in just the last two years!

How can this enormous growth be explained? The fact that processors are getting ever cheaper and smaller plays a role, but also storage capacities are doubling every two years, and the higher transfer speeds are another aspect. Digital communication, information and exchange are being taken more and more for granted both in the private sphere and in business life. But the decisive surge presumably originated in the mobile availability of the Internet on smartphones. The explosive data growth is accompanied by the global spread of smartphones and the enhancement of their functionality with ever-new technology and apps. To illustrate: in 2011 there were no smartphones with digital payment function, mobile TV or health apps. Today, these are all standard equipment on new smartphones. Within the shortest period of time, the smartphone has developed into the mobile hub for the exchanging of numerous personal data. Every single piece of information can be stored electronically somewhere,

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and this includes large amounts of health data. The question remains as to whether and how this information can be usefully evaluated and used.

And it is a question that the health-care and insurance industries have been occupying themselves with since way before the advent of the smartphone, because the digitalisation of health has been striding forwards for decades now: in the U.S. today, around 70 per cent of all clinical data are available in electronic form. But most of this information is not used for any further purpose. And this despite the fact that better networking and the purposeful assessment of these health data would without doubt be beneficial, for example, to ensure medical assistance in rural areas despite a scarcity of medical practitioners, or to gain a better understanding of the risks arising from the demographically-based increase of chronic ailments and to protect against them. In reality, this is hardly happening at all, because the data formats available and their IT systems are not suitable. The reason for this is the silo mentality in a heavily fragmented health-care system. Each clinic has its own data system, which means that the information is not comparable. For life and health insurers this means that around 90 per cent of all data are largely inaccessible to them. The EU Commission has recognised this and formulated the following demand in its eHealth Task Force Report 2012: "Governments should ensure that health data is … gathered in a standard way, anonymised and then made freely available to anyone that can add value to it."[1]

Up to now, this demand from 2012 has not been fulfilled either in the European or in any other health-care system, even though the dimension of the problem has further increased through the disruptive power of the smartphone. The American Medical Association, for instance, counted more than 97,000 health apps on the U.S. market in October 2014. They range from lifestyle apps for fitness, sports, wellness and nutrition, through to apps for medical monitoring by doctors, patients and consumers. For example, blood pressure, heart rate, body core temperature and blood sugar level can all be measured using a smartphone (often with the aid of additional hardware). Depending on the app, the owner of the smartphone can then transmit these data directly to the attending physician, who then has more information pertaining to the patient's blood pressure or blood sugar situation. Even skin cancer, as some apps promise, can be found without having to visit a doctor, simply by laying the smartphone on suspicious skin areas.

Lots of data, little significance?

Despite all the euphoria and the growing desire to measure one's own medical status, a good helping of scepticism is urgently advised here—both on the part of the user and in the health-care system itself, and even more so among life and health insurers. As the author sees it, four things have to be focused on particularly.

(1) **Quality** of the health apps: Many of these apps are still too complicated to understand and use, generating e.g. unreliable alarms when exceeding certain threshold values. In addition, there is an almost complete lack of universal standards, although they would be urgently needed. The U.S. IMS Institute for Healthcare Informatics rated about 90 per cent of all health apps with 'poor performance' in its 2013 study.

(2) **Compliance/engagement**: The fact that people like apps is made quite apparent by the enormous number of new ones being developed. According to one U.S. study, the usage duration of health apps is well above average, even when compared to non-health apps. Two-thirds of the users actively use their health app tool for more than a year, says the study. There are virtually no experience values on lasting changes of behaviour—for example, an adjustment of lifestyle. So the benefit of health apps for users would appear to remain unclear in this context. There are individual observations that evidence increased physical activity or more reliable tablet intake, but these findings are anything but proven.

(3) **Fragmenting**: End consumers use health apps on a wide range of different devices, such as smartphones, tablets, smartwatches and special monitoring devices such as step counters, bicycle tachometers, etc. Every single device gathers data, but who can bring all those data from different platforms together to form meaningful health profiles?

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[1] European Union (2012) *Redesigning Health in Europe for 2020*, Luxembourg: Publications Office of the European Union, p. 10.

(4) **Evaluation** of the gathered data: how can valid lessons be learned from the biometric data collected? Do the apps perhaps even have an effect on the mortality and morbidity of the user group—two parameters that are essential for life and health insurers? This and many other questions, first and foremost the issue of data protection, remain unanswered to date.

Big data as the key to business-relevant answers

The challenges described above illustrate that: the knowledge gain does not increase proportionately to the quantity of the data. That is why it will be so important to make the data useful through comprehensive analysis.

Here, enormous overlaps result with big data, a buzzword that has been dominating the media since last year. In the first instance, the term only refers to a data volume that cannot be analysed with customary methods, because it is quite simply too large and complex and it changes too quickly. That is why big data technologies are needed, to bring together, structure and evaluate unimaginable volumes of data from various sources almost in real time with the aid of intelligent algorithms. The first promising solutions are already here; the required IT is available and the software is now affordable as well. The goals of many big data projects are ambitious: using algorithms, they exploit the flood of data to identify correlations and patterns, and as the basis for decision-making in complex contexts. Even complex predictions no longer seem impossible—for instance, traffic-jam forecasts already function on this principle today.

In view of these opportunities, data are being referred to as the crude oil of the 21st century. But unlike black gold, the sources of digital gold are flowing ever more abundantly. Catchphrase: the Internet of Things: in January 2015, *Handelsblatt Online* cited the chief economist of the American Consumer Electronics Association (CEA) Shawn DuBravac as saying, "Two billion smartphones will become 50 billion networked devices". Then, he said, digitalisation will have reached the next level. Another example gives us a sense of what that means: the Google research lab is currently working on developing a contact lens for diabetics. It is said to have sensors that analyse the tear fluid to measure the blood sugar level. An integrated micro radio chip then sends the data in regular, short intervals straight to an app on the patient's smartphone. And in the future, it could fully automatically control an implanted insulin pump and theoretically, enable diabetics to lead a 'normal' life again.

The next disruptive leap—the iTunisation of personal health data?

This example shows that: the digital networking of biometric sensors (wearables) and various medical devices produces an enormous amount of health data that were never before available. Every single app gathers information and examines it separately in one way or another. A comprehensive health profile with meaningful data does not come about in this way. The Internet giants have also long since recognised this and acted. Owners of latest-generation smartphones already hold the first results of this in their hands: platform apps called Apple Health Kit, Google Fit or Samsung Health that automatically merge the data from all the installed health apps and compile a more comprehensive health profile. There now have been reports of considerable technical problems with the first versions of these apps, but fast digital progress will soon show these issues to be of a merely temporary nature, particularly in view of the fact that health data represent an asset of enormous value.

The role model is the iTunes principle for all kinds of music: The platform apps bundle all digital health data in one place, meet the user's demand for constant self-measurement and optimisation, give orientation or may help in the early recognition of medical problems. It is even conceivable that, in the future, they might serve as an electronic emergency pass and provide data that will open up entirely new business potential to commercial providers with the aid of big data technologies. It is to be assumed that a standardised IT platform will contribute significantly to the standardisation and quality improvement of health apps.

Opportunities and risks for the business model of life and health insurers

But wherever entirely new opportunities arise, risks also arise for established markets and business models. For example, it is entirely conceivable that medical problems might be recognised earlier in the future thanks to the

digitalisation of health data. This could drive the costs of health insurers for preventative measures way up. On the other hand, the costs of diagnosis could possibly be reduced by medical self-monitoring. Right now, nobody can say what the actual effects on the cost structures of the insurance industry will be.

And there is another risk: an increasing disparity of information between the policyholder and the insurance company. If the consumer no longer goes to a doctor to diagnose a suspicion of, say, skin cancer, and instead only has to consult his smartphone, could the anti-selection risk for life and health insurers not also increase? The consumers are better informed about their health risks, and risk-relevant information might no longer find its way into official medical records.

The legal framework is also having great trouble trying to keep pace with the rapidly increasing range of health apps: What minimum medical standards and requirements apply? Who is liable for a diagnosis provided automatically? Who do the obtained data actually belong to? And what about data protection? These and many other questions still remain unanswered.

And yet, the insurance industry cannot and must not ignore the trend: in order to exploit the opportunities provided by the digitalisation of health data, life and health insurers have to occupy themselves with this new technology and keep a close eye on possible consequences for their business model. Otherwise there is the danger that major Internet players from outside the insurance industry may move into the arising gaps and successively gain market shares. Since customers think less about tariffs when covering risks than about security for their problems, and seek orientation in an ever more complex (medical) world, health apps may be an option for improving the personal contact and lead to greater customer loyalty. For example, through the smart assessment of health data, life and health insurers, as the natural risk partners, could encourage their customers to lead more healthy lives. Applying behavioural economics insights, incentives could be offered here that might lead policyholders with a risky lifestyle to lastingly change their ways. In the best-case scenario, this might even change the image of the industry, away from that of a risk hedger that sanctions higher risk with higher premiums or exclusion clauses, towards that of a caretaker that proactively manages risk to minimise it.

Of course, this option is only one possible service or expansion of the business model that is made possible by the digitalisation of the insurance industry. It is without doubt recommendable to keep a close eye on these developments, which are not unimportant for life and health insurance companies.