

Digital Health

Is the euphoria justified?



December 2020

Digital Health

Is the euphoria justified?

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The Geneva Association

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Digital Health: Is the euphoria justified?

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Foreword



For the enormous hardship that the COVID-19 pandemic has brought to the world, there are a few silver linings if we look closely. Many industries, for example, achieved accelerated digitalisation as a result of people moving to virtual interactions in their professional and personal lives. Healthcare was one of these industries, and its digital transformation was long overdue.

Digital health, with the prospects that it can increase the accessibility and affordability of healthcare, is attractive for individuals, health providers and insurers alike. The research for this report was carried out during a period of sharp and significant growth in the digital health market. Projected increases on the supply and demand sides actually continued to rise throughout the research process.

Our research has found, however, that popularity and promise do not guarantee clear, positive, health or financial outcomes. During this period of incredible evolution of the digital health market, healthcare providers as well as payers, like insurers, must prioritise strategies that harness digital health for the benefit of society.

This will require a deep investment into understanding the gaps in digital health, such as obstacles thus far to reaching older populations, and how to address them going forward. There are daunting challenges surrounding data – how to integrate data across businesses and the looming issue for insurers of gaining and retaining customer trust. We are pleased to put forward recommendations in this report to help guide insurers on their digital health journeys.

Paradoxically, our health systems, perhaps now more stressed than ever, have the potential to soon be more advanced than ever. Insurers should seize this opportunity to contribute maximum value to the physical and mental health of their customers.

Jad Ariss
Managing Director



1. Executive summary

Digital health is already a multibillion dollar market and its growth is expected to continue at an increased rate in the coming years. In general, this growth has been spurred by factors including: improved access to affordable care; rising consumer expectations in a tech-enabled environment; and efforts to control the spiralling costs of care. More recently, the catalytic effects of COVID-19 have further accelerated the uptake of digital health. It is therefore timely for the insurance industry to take stock of its current strategy for digital health and understand how it can be harnessed to support global goals towards improved and equitable healthcare.

This report starts by outlining the landscape of the digital health market, focusing on popular consumer-centric solutions as opposed to provider- or payer-centric ones. Subsequently, the impact of digital health on health behaviour and outcomes is explored, and practice, perceptions and strategic considerations for the health and life insurance industry are elaborated upon.

The availability of detailed information on the supply-side characteristics of digital health varies by product and region, but there are common headline characteristics:

- Mobile apps have created a microcosm in the digital health market. A report by IQVIA in 2017 estimated that 200 health apps are published every day, often with limited regulatory oversight. Wellness apps dominate, but apps for specific health conditions have gained in importance in recent years. However, less than 50 health apps have been downloaded more than 10 million times, suggesting widespread fragmentation in the app market. Mental health, diabetes and cardiovascular diseases (CVDs) are the most popular intervention areas.
- Globally, the use of telemedicine has risen rapidly, triggered by the COVID-19 pandemic to provide round-the-clock consultations and advice on routine ailments. According to a report by McKinsey, in the U.S. alone, 46% of consumers now use telehealth compared to just 11% in 2019. In contrast, and beyond COVID-19, telemedicine interventions in Europe have a strong focus on health conditions such as CVDs, diabetes, chronic obstructive pulmonary diseases (COPDs) and obesity.
- Asia's share of the digital health market is on the rise. Funding has doubled from USD 808 million in the first quarter to USD 1,663 million in the second quarter of 2020. China is leading the way, with a sharp rise in telehealth seen during recent months. Countries with fewer resources across Asia and Africa have adopted digital health in areas ranging from financial protection to primary healthcare, often aided by a growing penetration of mobile phones.

Digital health is often seen as an antidote to the problems arising from inactive lifestyles. Mobile apps, sensors and fitness trackers promise long-term behavioural change and are most effective when they incorporate the key ingredients of behavioural change techniques (BCTs). However, a survey of mobile apps aimed at the wellness market found that few contained a

balanced spectrum of BCTs. While there is some evidence of positive behavioural change when digital health is paired with incentives, tools such as gamification and nudges appear to have mixed results. Self-selection of the young and healthy, omission of the elderly and sustaining behavioural change in the long run are all challenges.

The evidence on whether digital health improves health behaviour and outcomes is inconclusive. While there are indications of its effectiveness in some areas, more needs to be done to grow the body of research, with a focus on high-risk and high-cost groups.

The high-level evidence of the impact of digital health on physical and mental health outcomes is also mixed. Some studies show improvement when it is used for the treatment and management of certain chronic health conditions. Telemedicine fared better than products such as sensors or mobile apps and is understandably more conducive to complex health conditions that require in-person intervention instead of general software. In a study of 73 mental health apps, only two backed their claims with credible evidence. The use of an online-offline mix of care is associated with better results when paired with incentives. However, incentives to promote better behaviour and outcomes lag behind, with the majority of initiatives focusing only on discounts and gadgets. There are only a handful of examples where digital health is used as a means to lower premiums, co-payments or aid consumer life cycle planning to encourage long-term and more holistic consumer engagement. Generalisation of the available evidence is difficult in high-cost disease areas as studies are often conducted in healthier populations or are small scale. Furthermore, evaluation standards vary considerably. Finally, outcome data may be directly influenced by the lack of programme longevity.

Upon examining the nature of digital health utilisation across the insurance value chain, from purchase to claims, it appears that effort is concentrated in marketing and distribution. While there are innovations further down the value chain in areas such as underwriting and claims processing, many have not yet achieved scale. Issues surrounding data interoperability and fee-for-service reimbursement leading to misaligned provider incentives significantly curtail insurers' ability to use digital health more strategically.

Online survey

The findings from an online survey of 11 insurance companies and 20 digital health providers are congruent with those of the desk research. Most respondents have a strategic focus on increasing market share and improving distribution and consumer experience. Most insurers see digital health as a way to tackle non-communicable diseases (NCDs), but very few respondents indicate its usage for strategic data analytics to influence premiums, underwriting or claims. Most platforms across insurers and providers focus on populations under the age of 55, which may bode well in the long term but does little to address the current cost drivers arising from ageing, comorbidity and fragmented services.

Reimbursement to digital health providers by third-party payers, including insurers, appeared to be polarised. Providers either indicated that most of their revenue generated from such a source, or very little. Fee-for-service appeared to be the most prevalent payment method, also mirroring findings from the literature. This raises three concerns: firstly, there is a lack of quality vetting available for digital health products that are directly targeted at consumers without the scrutiny of a third-party payer; secondly, there are ramifications for potential cost inflation in health systems due to increased out-of-pocket expenses by consumers; and thirdly, there is little incentive for providers to moderate the overall volume of services in a purely fee-for-service environment.

Survey results revealed that there is limited uptake of digital health across the insurance value chain, minimising the potential for broader impact. While two thirds of insurers feel that digital health offers the services they need, almost all providers indicate that it has not yet been optimised to tackle consumer needs holistically.

The survey also revealed that there is limited uptake of digital health across the insurance value chain, minimising the potential for broader impact. While two thirds of insurers feel that digital health offers the services they need, almost all providers indicate that it has not yet been optimised to tackle consumer needs holistically. Both insurers and providers mentioned challenges associated with the availability of resources to accelerate digitalisation, the lack of prioritisation of digital health, difficulty changing mindsets, legacy systems (the lack of data interoperability) and readiness in distribution channels as common barriers. In addition, providers

specifically highlighted that inadequate reimbursement for products and misaligned incentives pose problems for scaling up initiatives. Both insurers and providers underscored the need to improve consumer trust and find ways to include older cohorts. They also emphasised the risks posed due to the lack of data governance and cybersecurity issues.

Recommendations

Based on the above findings, we propose six ways in which insurers, at the company and industry level, can shape the digital health market to optimise its societal benefits alongside realising new business opportunities.

- **Articulate a holistic digital health strategy.** At present, there is no comprehensive vision that articulates how insurers need digital health and vice versa. Its deployment is mostly motivated by marketing, distribution and sales, reflecting a narrower form of consumer engagement to ensure (re)purchase. There is limited insight into whether it is being used systematically to address cost drivers, lower premiums and claims and extend coverage to those at risk or in need of care. A more holistic appraisal of the business and societal opportunities that arise from digital health for health and life insurers is needed to ensure its readiness to tackle the risks emerging from rapid global epidemiological and demographic shifts.
- **Align payment incentives for digital health.** Digital health providers already have strong incentives to innovate in order to sustain themselves in a dynamic market. If these providers also begin to share some of the risks of rising health costs through value-based reimbursement methods rather than just fee-for-service, they may be incentivised further to develop more efficient service offerings. These offerings could aim to encourage the integration of wellness and management initiatives across a wider population segment.
- **Prioritise trust through voluntary charters.** The growth of digital health is largely dependent on the willingness of consumers to share private data. While regulation is critical to improving data governance, and many examples already exist, there remains a grey area concerning mobile apps. Building consumer trust in digital health will require a more personalised approach and softer, consumer-centric action. Alongside regulation, country-, regional- or even global-level voluntary industry charters could be a starting point for agreeing on some ground rules related to privacy, transparency, societal well-being and accountability. Such charters could also be used as a platform to involve, sensitise and communicate with consumers and to help endorsing companies stand out from the crowd.
- **Recognise organisational context and improve capacity.** While the industry recognises the importance of health and wellness data for consumer impact and product design, each insurer's position on its path to digital transformation will need to inform specific goals, approaches and timelines in order to set realistic expectations. Organisational impediments and support systems need to be considered, and dedicated investment to improve capacity may be required before engaging with wider health system stakeholders. For instance, data governance limitations and issues related to interoperability would no doubt require collaboration with governments and providers. However, as a starting point, the industry and individual insurers will need to assess problems and crystallise their views on the desired solutions internally before initiating an external conversation.
- **Create a digital health marketplace.** The health and life insurance industry can unlock significant value by creating a digital health marketplace, in collaboration with others, that brings relevant digital and in-person solutions together, with outcomes, quality and affordability at the core. This shared marketplace can facilitate a much needed dialogue across companies and encourage rationalisation of products by creating common standards (e.g. a health outcomes database), effectively leveraging experiences and having a unified voice while working hand-in-hand with governments on crucial topics like data and security.

The insurance industry can drive digital health toward impactful products and services through its purchasing power. Insurers can move away from being reactive risk managers or simple claims payers to actively supporting insureds in managing their health.

- **Marshal the evidence prior to purchasing digital solutions.** The insurance industry can drive digital health toward impactful products and services through its purchasing power. Insurers can move away from being reactive risk managers or simple claims payers to actively supporting insureds in managing their health. There are two factors involved in achieving this goal. Firstly, investment is needed in detailed claims analysis so that digital services can be targeted at the right population cohort, such as the high risk or elderly, to achieve improved health and financial outcomes. Secondly, the industry can work with digital health companies and academia to develop standards for evaluating digital health products to inform any investments and commissioning of services.



2. Introduction

A 2017 Lancet study projected global healthcare expenditure to rise from USD 9 trillion to USD 24 trillion in the space of 25 years (2014 to 2040).¹ The world will be short of 18 million health workers by 2030² and, by 2050, 16% of the global population will be over the age of 65, a cohort that has already outgrown the number of children under five years old in recent years. These demographic shifts and the resultant rise in chronic illnesses, coupled with the ongoing pandemic and squeezed public budgets, mean health needs are unlikely to be met solely by a brick-and-mortar health system. As such, digital health is seen by many as the solution to creating health systems that are agile, efficient and fit for the future.

As a result of demographic shifts, the rise in chronic illnesses, the ongoing pandemic and squeezed public budgets, health needs are unlikely to be met by a brick-and-mortar health system. Digital health is seen by many as the solution to creating health systems that are agile, efficient and fit for the future.

In a recent survey led by Roland Berger³ of leading healthcare experts, 50% of respondents thought insurers are likely to face the second biggest business model disruption from digitally-powered health platforms, trailing only behind physician and outpatient service models. Insurers and payers overall have been slow to adopt digitalisation compared to other sectors^{4,5} and most digital health solutions currently target consumers directly. Even though the status quo is starting to change as more health and life insurers look to harness this nascent market to diversify their product line, grow their consumer base, improve customer experience and counter the effects of low interest rates, some important gaps remain in evidence and practice.

Firstly, like many health systems, the digital health market remains fragmented. The difference between lifestyle and medical information is increasingly blurred. There is a noticeable silo between digital health that targets the healthy versus those living with more complex conditions, with little integration between the two. The uncurated nature of the market means that the onus falls on consumers to choose solutions, often with limited information. Efforts to narrow this informational asymmetry and steer the market towards efficacious and holistic solutions remain poor.

Secondly, a 2019 survey showed that just 3% of global health and life insurtech engages in pooling risks. The vast majority represents technology firms that focus on providing software to life and health insurers.⁶ Others point out that the application of digital solutions in health and life insurance is skewed towards upstream functions such as sales and distribution (Figure 1).⁷ Hence, evidence of the effects of digital health on high-cost consumers and the consequent effects on premiums or claims remains modest. For instance, a study of 4.5 million people in the Netherlands by Whamms et al.⁸ showed that the top 1% of high-risk users

Box 1: Digital health: Why do we need to take stock now?

An uncurated space: The onus falls on consumers to choose appropriate solutions with little information about efficacy. Does the industry address this information asymmetry?

Lack of a holistic strategy: Evidence of the effects of digital health on premiums and claims remains modest. Does the industry have a comprehensive vision?

Conditions of scale up are absent: Scaling credible solutions is challenged by the lack of capacity, payment incentives, external barriers and ethical considerations. How can insurers address this both individually and collectively as an industry?

consumed over a fifth of all care. Similarly, in the U.S., 5% of consumers utilised 50% of health resources.⁹

Thirdly, the conditions needed to scale up digital interventions are challenged by capacity, the siloed nature of health and life solutions, payment incentives and regulatory and ethical considerations. It is not clear how the industry plans to overcome these challenges.

A review of the industry's need for digital health that balances the societal need for affordable healthcare with corporate objectives of growth and profitability is required.

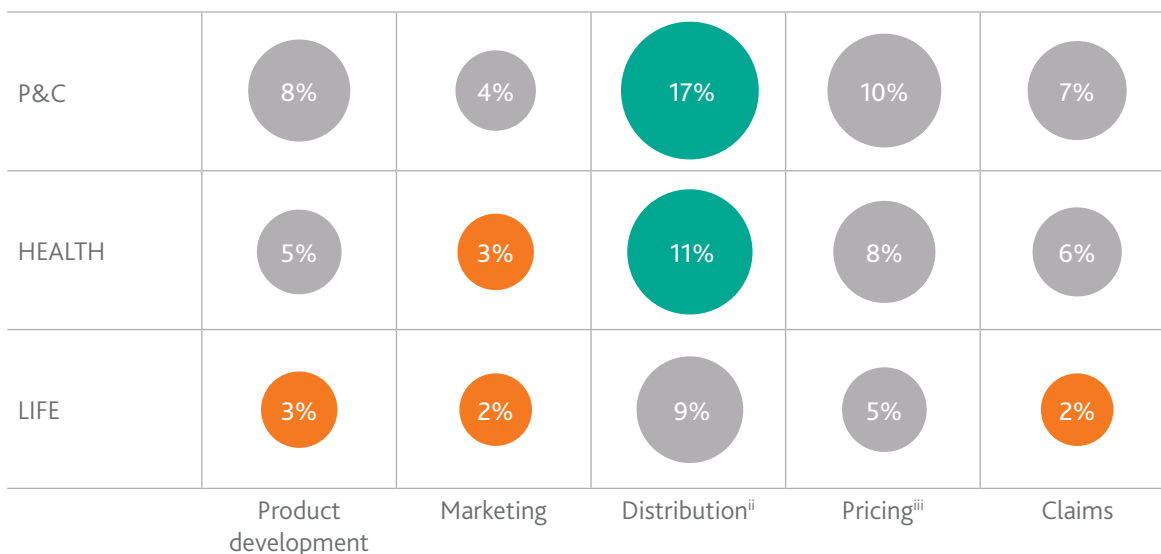
The dearth of literature appraising digital health from a health and life insurance perspective suggests that a review of the industry's need for digital health that balances the societal need for affordable healthcare with corporate objectives of growth and profitability is required. This report aims to tackle an early subset of questions pertaining to the scope of the digital health market that targets consumers, their effect on health behaviour and outcomes and consequent insurer strategy. To do so, a mixed methodology consisting of a review of academic papers, white papers and unpublished reports from Geneva Association (GA) members is employed. This is supplemented with expert insights and a qualitative survey involving 11 insurers and 20 digital health providers to explore perceptions, gaps and opportunities.

Figure 1: Where do insurtechs focus?

Number of innovations as % of total in the databaseⁱ

Share of innovations in insurtech database

■ <4% ■ 4-10% ■ >10%



i ~500 commercially most well-known cases registered in the database (excluding wealth management-related innovations)

ii Includes sales

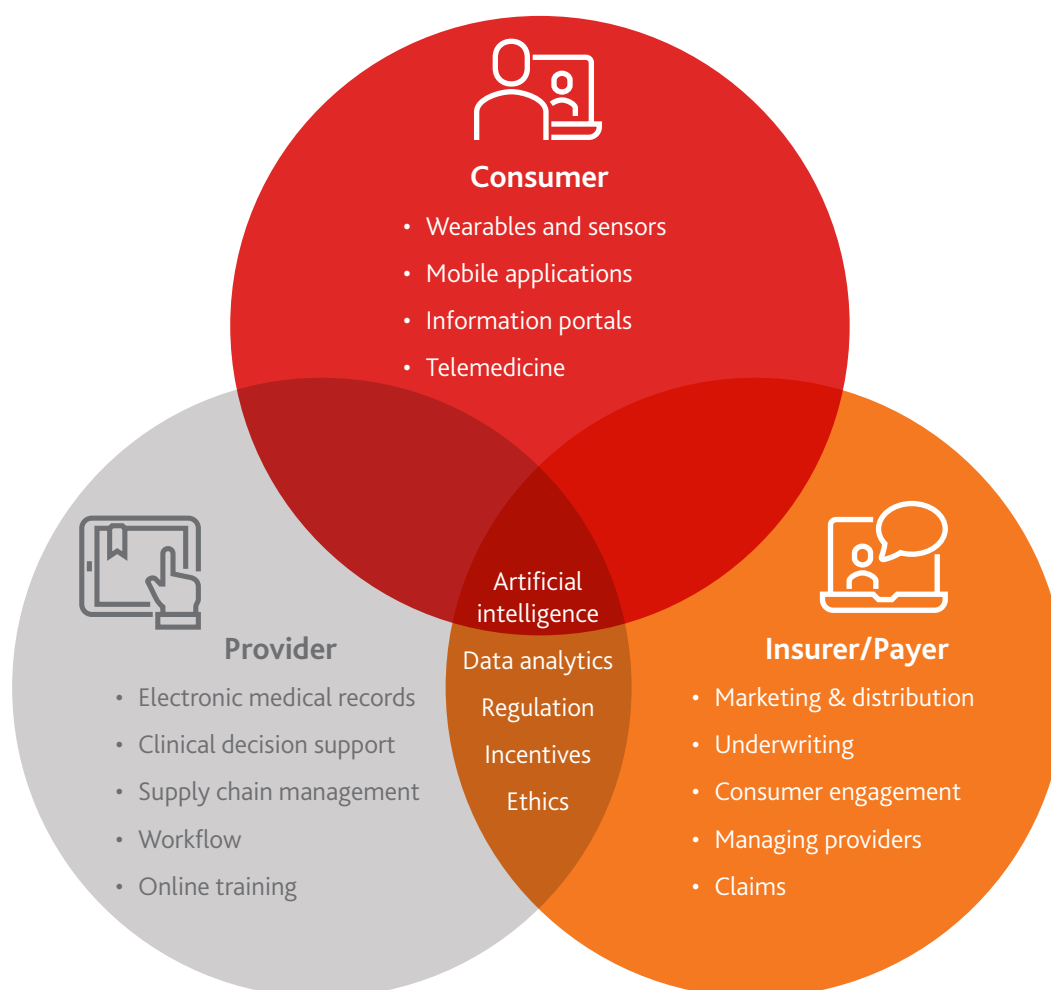
iii Includes underwriting and policy issuance

Source: McKinsey 2017

The expansive nature of digital health, varied definitions and interchangeable terms used to describe it (e.g. m-health, e-health, connected health) and emerging concepts such as personalised medicine and digital therapeutics have created myriad interpretations of the topic. For simplicity, we broadly classify digital health from the user perspective: digital delivery channels that directly target *consumers*; digital tools that target *providers* to organise care delivery, for example electronic health records; and tools that affect the *insurer/payer*, such as data-supported underwriting or data to monitor provider service patterns. Together they create an ecosystem bound by cross-cutting functions ranging from artificial intelligence (AI) to ethics (see Figure 2).

The remit of this report will be limited to the most common consumer-facing digital health tools, which are classified into four areas: wearables and biosensors to measure steps, heart rate, blood glucose etc.; survey-based tools to track mood and patient-reported outcomes, often via mobile applications; education or reference portals to improve awareness or understanding of a given health condition; and telemedicine for remote consultations and management of health conditions with a video or audio interface. It will subsequently reflect on how evidence and data from these tools are used by insurers across the value chain. Areas such as smart pills, DNA testing kits or products that target *providers* will remain outside of the scope of this report.

Figure 2: An illustration of digital health by users



Source: The Geneva Association



3. The digital health landscape

3.1. The momentum behind digital health

The digital health market is set to grow from USD 103 billion in 2019 to USD 386 billion in 2025, a Compound Annual Growth Rate (CAGR) of 24.6%.¹⁰ This growth, among other things, may be explained by four factors.

- **Accelerated access to affordable care:** Vast amounts of healthcare needs are unmet. Over half the global population still lack access to basic health services, with as many as 100 million people being impoverished annually because of direct, out-of-pocket payments (OOPs) which represent more than a third of global spending.^{11,12} While countries are at different points on the Universal Health Coverage (UHC) spectrum, digital health is increasingly seen by many as one way to address such inequity through innovative service delivery channels that reach underserved communities with affordable care.
- **A tech-enabled environment:** Globally, five billion people own a mobile phone (over half are smart phones)¹³ and there are over a billion mobile banking accounts.¹⁴ Consumers live in a tech-enabled environment and expect more agility in how they receive services. Today, over three quarters of patients in the U.S. resort to online health information and about two thirds choose providers based on their reviews,¹⁵ thereby challenging the long-held perception of a paternalistic model of care between doctor and patient. Products such as wearables and mobile apps are empowering users towards wellness and self-care. A new breed of 'Netflix' health delivery platforms powered by AI chatbots and telemedicine are directly targeting consumers through a mix of online and offline care, and a handful of insurers are taking an active role in integrating health provision and making greater use of data analytics to offer more nimble and cheaper health coverage.

Digital health has become a crucial consideration in promoting the financial sustainability of health systems, with better targeting of interventions and reduction of unnecessary physical visits.

- **Spiraling costs of care:** According to the OECD, 20% of health resources are wasted.¹⁶ Digital health has become a crucial consideration in promoting the financial sustainability of health systems, with better targeting of interventions and reduction of unnecessary physical visits. As such, some health and life insurers are shifting their focus from pure financial protection and long-term savings products to wellness, prevention and disease management to keep risk

pools healthy while addressing cost inflation. Life insurance in particular, which has historically played an important role in financing lifestyle in retirement, has come under pressure, with low interest rates, people outliving their savings, rising rates of NCDs and depleting pension assets. (Digital) health is seen by some as a way of attracting younger customers earlier with value-added services, while also promoting active ageing among existing policyholders.

- The catalytic effects of COVID-19:** Digital health has been at the centre of the pandemic. It has become an integral part of national contact tracing systems and the inevitability and acceptability of digital health can be seen by the sharp rise in utilisation during the ongoing crisis.^{17,18} In the U.S. alone, 46% of consumers now use telehealth compared to just 11% in 2019, with some predicting virtual channels could take on a fifth of all care, worth around USD 250 billion.¹⁹ Similar surges have also been reported in the U.K.²⁰ Payers and regulators, in a bid to adjust to these new realities, have approved the utilisation of digital health at a pace not seen before.²¹ While COVID-19 will likely continue to transform these realities, this sudden pivot towards digital health will no doubt lead to some structural changes in health systems globally. This is already manifested through the growth of online health insurance sales in China, estimated to grow by 43% per year until 2025.²² Similarly, investment in digital health

startups in the U.S. alone amounted to USD 9.4 billion during the first three quarters of 2020,²³ making it one of most funded periods for health innovation.

Digital health has been at the centre of the COVID-19 pandemic. Payers and regulators have approved its utilisation at a pace not seen before and this sudden pivot towards digital health will no doubt lead to some structural changes in health systems globally.

3.2. What does the digital health mass market offer?

A variety of digital health products are available across the care continuum (see Table 1). However, the level of granularity in the information available on digital health varies considerably by product and region. Hence, this section will focus on global and, where possible, regional headline characteristics, reflecting on the products that are available, their focus and expected growth in selected markets.

Table 1: The care continuum and digital health touch points

HEALTHCARE CONTINUUM						
		Wellness	Prevention	Diagnosis	Treatment	Long-term management (professional & self-care)
PRODUCTS/DIGITAL CHANNELS	Wearables	▲	▲			
	Mobile applications	▲	▲	▲		▲
	Health information portals	▲	▲	▲	▲	▲
	Telephone triage			▲		
	AI chatbot triage			▲		
	Point of care testing			▲		▲
	Telemedicine (audio & video consults)		▲	▲	▲	▲
	Remote monitoring devices			▲		
	Text nudges & reminders	▲	▲		▲	▲

Source: The Geneva Association

Mobile apps alone have created a microcosm in the digital health market. According to a report by IQVIA, there are currently over 318,000 health apps and 340 wearable products available globally and an estimated 200 health apps are added to the market on a daily basis.²⁴ Apps with a focus on wellness still dominate, making up over 60% of the market, but market share for those focused on specific health conditions increased from 25% to 36% in two years (Figure 3).^a Remarkably, however, less than 50 of these apps have been downloaded more than 10 million times

– the overwhelming majority have been downloaded less than 5,000 times.

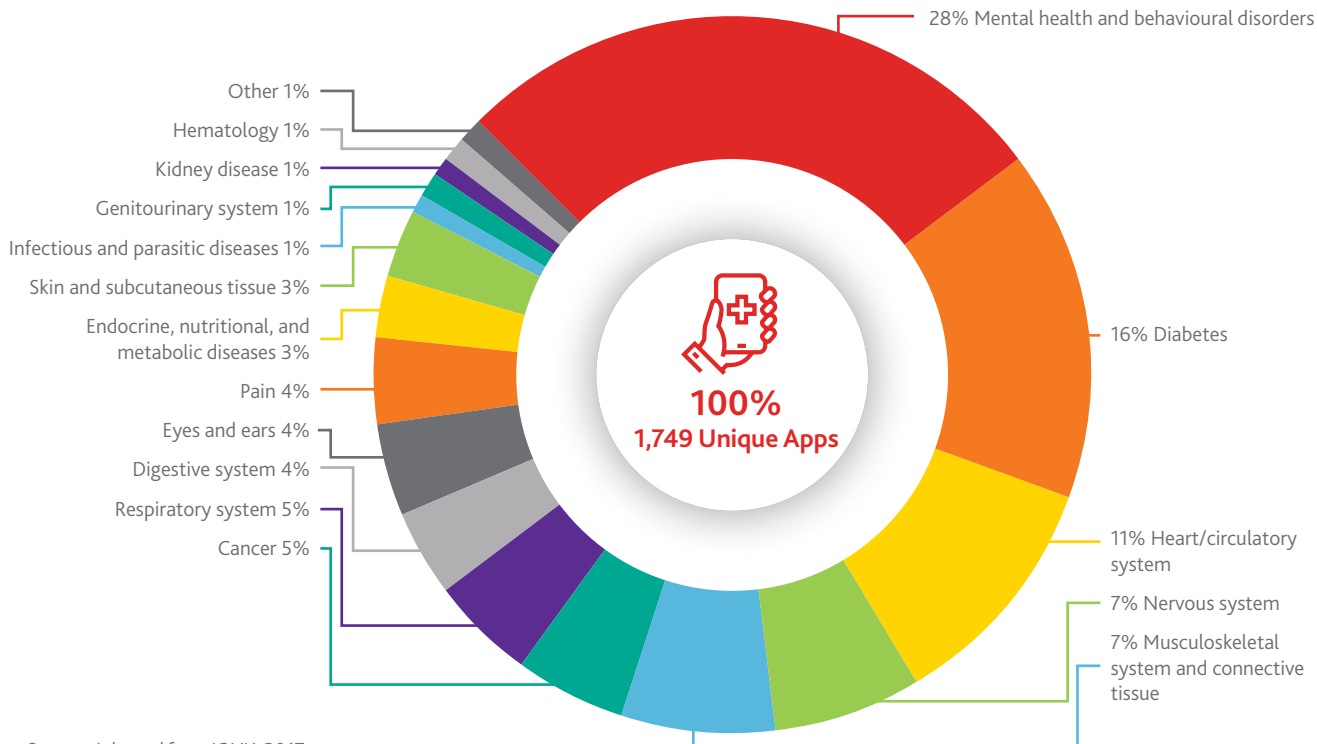
Among disease-specific apps, mental health, diabetes and CVDs are the most popular intervention areas (Figure 4).^{24, a} Another report points out that an estimated 50 million people resort to such mobile apps for triaging services, with symptom checkers being the most commonly-used service.²⁵ As discussed above, telemedicine services have seen a rapid rise globally to tackle a whole spectrum of

Figure 3: Mobile health apps by market share (%)^b



Source: Adapted from IQVIA 2017

Figure 4: Breakdown of disease-specific mobile apps



Source: Adapted from IQVIA 2017

a Figures 3, 4 and 5 show the latest data accessible from the public domain.

b Note that the figures for 2015 and 2017 do not add up to 100% because a certain category of app has been excluded from the report.

care, ranging from consultation to management in the COVID-19 context.²⁶

Regionally, the picture is a bit more nuanced. In the U.S., where chronic diseases drive 75% of health spending,²⁷ a study by Cohen et al.²⁸ found that the majority of digital health companies (73.2%) focused on disease management. Less than a quarter (23.8%) tackled prevention and just 13% focused on diagnosis, perhaps one of the factors that explain healthcare cost inflation in the U.S.^c The authors also observed that general software products with no specific targeting of clinical areas were the most common, followed closely by telemedicine. Biosensors and wearables were most prevalent for supporting general wellness. One explanation for the weakness in the wellness and prevention market could be attributed to reimbursement methods in the U.S., which prioritise the management of conditions.²⁹

Although the lion's share of digital health investment in the Americas is focused in the U.S., nascent markets like Brazil lead the way in the south. With the fourth largest smartphone market globally and nearly half of its population sensitised to wearables, the stage looks set for a virtual expansion of care in Brazil, closely followed by Mexico.³⁰ As such, commentators point out that the Brazilian market for remote care, ranging

from blood pressure monitoring to elderly care, could grow by 8.6% annually to reach a total valuation of USD 17.5 billion by 2020.

Europe is estimated to account for 30% of the world's mobile app market.³¹ The most prominent markets for mobile app developers are the U.K., Germany and the Netherlands, followed by some of the Nordic countries. A third of all apps focus on mental health, after which diabetes, heart and circulatory diseases are the most popular. Telemedicine solutions have a strong focus on tackling NCDs, with CVDs, diabetes, COPDs and obesity topping the chart at 68%, 52% and 49%, respectively (see Figure 5).^{32, a}

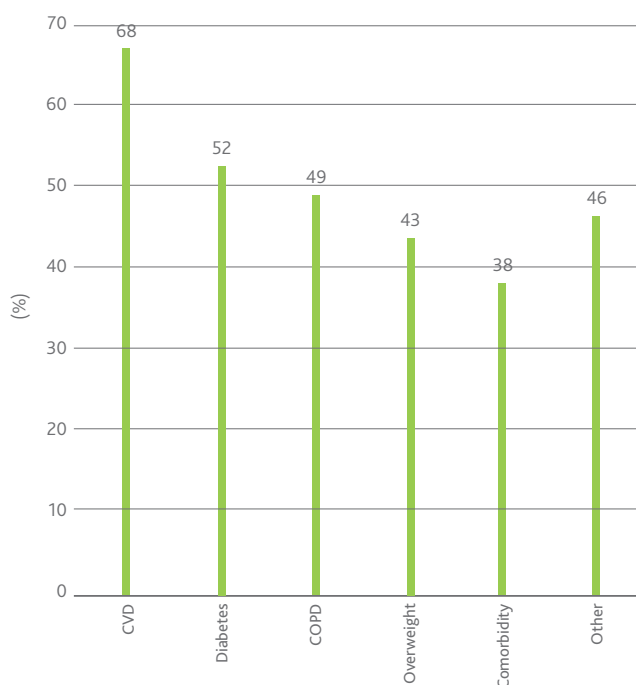
Telenor Health

Telenor Health in Bangladesh offers an AI chatbot-supported telemedicine service to more than five million people. Initiated as a value-added service to Grameenphone subscribers, the product offers patient triage and referral to a quality-assured network of 1000+ providers, discounted consultations and microinsurance to customers to protect them from catastrophic healthcare costs for hospital stays.

Babyl

Partners with the Rwandan government and the publicly-sponsored community-based health insurance scheme to offer virtual consultations to urban and rural beneficiaries. This virtual model has resulted in a noteworthy reduction in the cost of care from USD 10–13 per face-to-face visit to USD 1 for online consultations. On average, the system deals with 2,000 appointments a day and has 600,000 users.

Figure 5: Digital health focus areas in Europe



Source: European Commission 2018

Health systems and their capacities vary widely in many Asian countries, making any broad generalisation on digital health difficult. However, the Asian digital health market has been particularly buoyant, despite the COVID-19 crisis, with funding doubling from USD 808 million in quarter one to USD 1,663 million in quarter two of 2020. China, where telehealth has seen a sharp rise in recent months, is leading the way.³³ As much as 17% of mobile health apps now originate from Asia and Pacific countries,³⁴ suggesting a marked shift in the use of digital health over the coming years.

c The total may come to more than a hundred as some companies may focus on multiple areas.

Countries on the lower-income spectrum across Asia and Africa begin to share some characteristics. High OOPs, weak health infrastructure, insufficient workforce and remote settings are some of the common pressure points that have paved the way for digitalisation in these settings. This has been possible due to growing internet and mobile connectivity. For instance, emerging insurance markets such as South Africa, Kenya and Nigeria now have a

mobile penetration of 38%, 59% and 45%, respectively.³⁵ Today, the digital health markets in Africa and many parts of Asia touch on all components of health systems, including financial protection through mobile money,³⁶ wellness information, referral platforms for essential services such as maternal and reproductive health³⁷ and AI-powered telemedicine dealing with primary care.³⁸

Figure 6: A growing interest in digital health across the Americas, Europe and Asia-Pacific regions

(a) Reasons for using digital health

Consumers are using technology and tools for various health reasons, with fitness and health improvement tools being the most frequently used

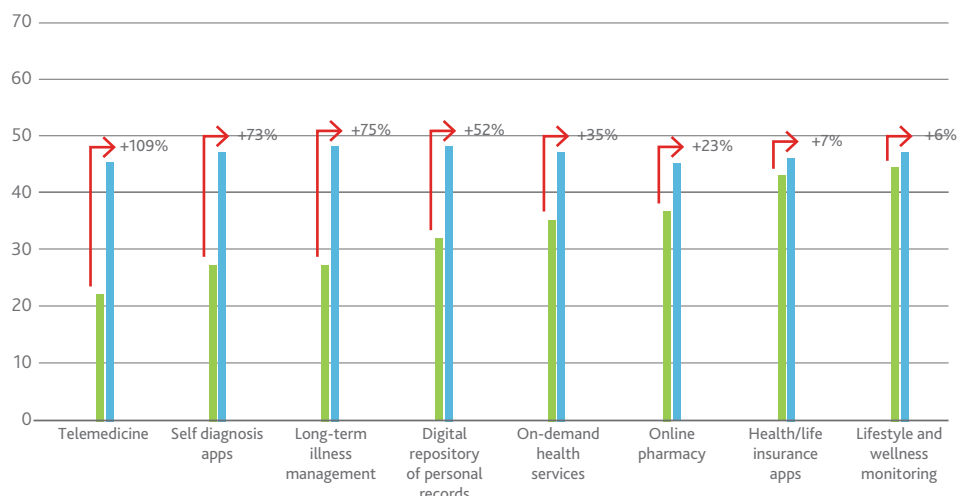
Q. In the last 12 months, have you used any technologies including websites, smartphone/tablet apps, personal medical devices, or fitness monitos for any of the following health purposes?

	Australia	U.K.	Canada	Denmark	Netherlands	Germany	Singapore	U.S.
Measure fitness and health improvement goals (e.g. exercise, diet, weight, sleep)	40%	37%	43%	39%	37%	35%	53%	42%
Monitor health issues (e.g., blood sugar, blood pressure, breathing function, mood)	21%	21%	27%	21%	21%	24%	35%	27%
Receive alerts or reminders to take medication	17%	15%	20%	17%	19%	18%	21%	21%
Measure, record, or send data about medication you are taking	13%	11%	15%	16%	19%	13%	21%	20%
Order a repeat prescription supply	18%	38%	29%	49%	36%	22%	16%	48%

Note: Charts shows percentage of respondents who said 'yes'

Source: Deloitte Center for Health Solutions 2019 Global Health Care Consumer Survey and 2018 Health Care Consumer Survey

(b) How do Asian-Pacific consumers want to receive healthcare in the future?



91% of consumers would use digital health services if the costs were covered by an employer or insurance provider

Note: Percentage of consumers who indicated they would use a tool now or in the future, on the basis of the question: 'From the list of tools and system below, which (1) have you used in the past months, (2) would you use in the next 5 years if made available, or (3) have you not used and do not expect to use in the future?' and who answered yes to the question: 'If digital health services were covered by your insurance plan (if any) or your employer, would you be willing to use the services?'

Source: Bain & Company 2019

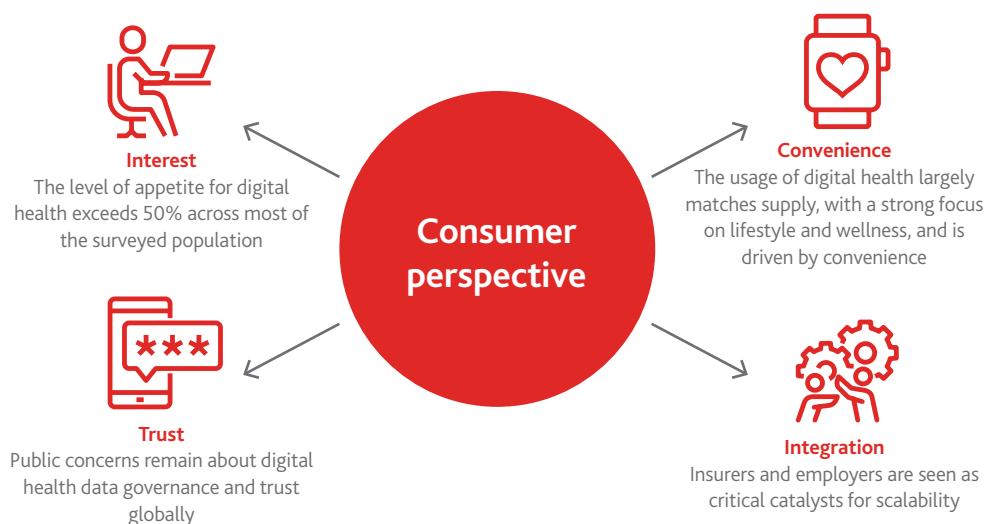
3.3. How are consumers using digital health?

In a 2019 consumer survey from eight mature markets across the Americas, Europe and Oceania,³⁹ 50% of respondents indicated that they use digital health to improve overall wellness (Figure 6), echoing the global supply-side trends discussed above. On the modality of use, a more regionally-focused survey of European Union (EU) member states found that 53% of citizens sought health information online in 2019, with Finland taking the lead.⁴⁰ Parity in usage varied by age and was especially stark when it came to the utilisation of mobile apps. In a survey of app utilisation of seven EU member states (Austria, Bulgaria, Estonia, France, Germany, Italy and the U.K.),⁴¹ nearly three quarters of the survey respondents (n = 4000+) did not use any health app, and users disproportionately represented younger cohorts. This raises doubts about whether certain digital health products are reaching older cohorts, who have an increased likelihood of developing comorbidities and the need to manage them. The surveys also indicated that while there is a growing understanding of the importance of data sharing, data governance and trust remained key issues.⁴² The importance of trust in the 'health data domain' was also pointed out in a 2018 National Consumer Health Survey that showed only 11% of respondents would be willing to share health data with technology companies.⁴³

There are doubts as to whether certain digital health products are reaching older cohorts, who have an increased likelihood of developing comorbidities.

Mirroring global and regional trends, a survey by Bain & Company⁴⁴ across Asia-Pacific countries (Australia, China, India, Indonesia, Singapore and Thailand) showed that consumers increasingly place high value on wellness services (83%), convenience of use (80%) and the availability of online information on health (74%). Furthermore, 70% of respondents expressed a preference for a single entry point to manage their healthcare journey, with 28–59% of consumers showing a preference for this to be via a mobile app or smart device across the six markets. More importantly, 91% also expressed an interest in using digital tools if integrated with insurance or employment benefits (Figure 6).

Consumer perspective: The most prominent themes





4. The hype versus the facts

4.1. Does digital health lead to healthier behaviour?

Globally, 1.4 billion adults are at risk of worsening or developing chronic diseases due to inactivity, and levels of inactivity are over two times higher in high-income countries than low-income countries.⁴⁵ Avoidable health risks connected to obesity, high blood pressure and smoking accounted for USD 730 billion, or 27% of total health spending, in the U.S. in 2016.⁴⁶ Digital health is often seen as an antidote to this and has given rise to an era of the 'quantified-self' – data from wearables, sensors and mobile apps equip users with knowledge that allows them to take decisive steps to preserve their health and well-being. Consequently, they are able to play a part in any clinical decision making.⁴⁷

Table 2: Behavioural change techniques in popular mobile apps

Behavioural change technique	n	Proportion
Provide instruction on how to perform behaviour	111	0.66
Model/demonstrate the behaviour	88	0.53
Provide feedback on performance	83	0.50
Goal setting – behaviour	63	0.38
Plan social support/change	61	0.37
Information about others' approval	46	0.28
Goal setting – outcome	40	0.24
Prompt review of outcome goals	31	0.19
Set graded tasks	25	0.15
Provide information on where and when to perform the behaviour	18	0.11
Prompt self-monitoring of behaviour	17	0.10
Prompt self-monitoring of behavioural outcomes	16	0.10
Teach to use prompts/cues	11	0.07
Prompt rewards contingent on effort or progress toward behaviour	10	0.06
Prompt rewards contingent on successful behaviour	10	0.06
Action planning	6	0.04
Information on consequences of behaviour to the individual	6	0.04
Prompting focus on past success	5	0.03
Information on consequences of behaviour in general	4	0.02
Stimulate anticipation on future rewards	4	0.02
Environmental restructuring	2	0.01
Normative information about others' behaviour	1	0.01
Relapse prevention/coping planning	1	0.01
Shaping	1	0.01

Source: Conroy et al. 2014

Mobile applications, sensors and fitness trackers are the most common channels that promise to influence long-term behavioural change. They do this by incorporating an array of triggers that are either educational or motivational.⁴⁸ Behavioural scientists suggest that digital technology works best to create favourable behavioural patterns when it incorporates the key ingredients of BCTs (examples are outlined in Table 2).^d However, a survey⁴⁹ of the 167 top ranked mobile apps aimed at the wellness market found that very few contained the balanced spectrum of BCTs identified by the Coventry, Aberdeen and London–Revised (CALO-RE) taxonomy. This mirrors the findings by Mercer et al., who noted that just 16 of the 40 well-known BCTs were present in some of the leading activity trackers in the market.⁵⁰ This casts doubt on whether digital health can live up to its claim of improving health behaviour as the novelty of using a new product starts to wear off.

Generally speaking, the most common mass market digital health solutions incorporate one or more of the following BCTs. The evidence on their efficacy in changing as well as sustaining good health behaviour is less clear cut.

BCTs in common mass market digital health solutions



Source: *The Geneva Association*

Goal setting and incentives provide more favourable evidence. A randomised control trial (RCT) involving meat factory workers in New Zealand⁵¹ found that the participants who used a digital pedometer (compared to the other half who were just given educational materials) with the goal of increasing their weekly step count by 5% substantially improved their BMI, body fat and waist circumference. The increase in step count remained significant within the intervention group three months

post-intervention, representing a 59% improvement over baseline scores. A study by Kurti et al.⁵² comparing the effects of digital health alongside monetary and non-monetary incentives on sedentary adults found that both intervention and control groups successfully increased their step count by an average of 108%, though they observed that monetary incentives led to greater improvements. Similarly, a study⁵³ of 11,881 users in the U.K. showed that short-term incentives in the form of discounted cinema tickets, hot drinks etc. improved annual activity days by 56%, with an impressive 554% increase in low-activity users compared to 205% and 17% in medium-activity and high-activity users, respectively. The study also noted a concomitant reduction in relative mortality risk of 7%, 5% and 3% in low-, medium- and high-activity groups, respectively, with a sustained impact of these incentives two years post-intervention. Other studies exploring similar incentivised schemes that included aspects of digital health found a positive uptake of preventative services, such as screening for cholesterol, blood sugar and prostate-specific antigen, mammograms,⁵⁴ and healthier food consumption.^{55,56,57}

A more mixed picture emerges where information, feedback, habit-forming prompts and nudges are concerned. In an RCT in the U.S., Wang et al. found that while wearables were effective in increasing physical activity in obese and overweight adults, text prompts or nudges sent to intervention groups had little effect.⁵⁸ However, personalised information through text messages in some contexts have facilitated greater uptake of reproductive health services among women.⁵⁹ In the same vein, while nudges have shown positive effects on user adherence to medication,⁶⁰ their long-term effects remain unknown.⁶¹

Disproportionate representation of the young and healthy in studies of digital health on the behaviour of high-risk groups who stand to benefit most from the technology – the elderly, sick or poorer members of society – is often limited.

One persistent problem includes self-selection of users who have a heightened awareness of wellness and are able to afford digital sensors. This group may be disproportionately represented in studies compared with those who stand to benefit most from the technology.

^d Table 2 shows the latest data accessible from the public domain.

A survey of wearable devices showed 58% of owners were under the age of 35 years and more than a quarter (29%) earned over USD 100,000 a year.⁶² It is highly probable that this digitally savvy and connected cohort are more likely to respond positively to habit-forming and peer-supported digital health products reliant on social media networks or forms of gamification. With some exceptions,⁶³ at this stage it may be reasonable to infer that there is limited evidence on the effects of digital health on changing and sustaining healthy behaviour, especially among high-risk groups, i.e. the elderly, sick or poorer members of society. The extent to which these high-risk groups are represented in studies is not always clear. Similarly, while some BCTs perform better than others, the body of evidence remains variable and it would be erroneous to form a definitive conclusion without more targeted research. The longevity of the effects of digital health among the clinical population has also been questioned by some,⁶⁴ while others have raised fears about the safety of the plethora of uncurated solutions available on the market⁶⁵ and the adverse effects they may introduce, such as obsessive checking and a false sense of security.⁶⁶

4.2. Does digital health lead to better health outcomes?

As already discussed, NCDs and ageing are the two most prominent drivers of cost inflation in healthcare.^{9, 49, 67, 68} As more insurers look to add value using digital health, appraising whether it makes a difference to costly care beyond prevention and behavioural change is key to informing future investment. The evidence on its impact on health outcomes is highly variable.

Using a novel methodology to assess clinical impact by evaluating peer-reviewed studies, Safavi et al. found that just 27.9% of peer-reviewed studies on digital health in the U.S. targeted high-risk and high-cost population cohorts and a mere 8% focused on clinical effectiveness in high-risk users.⁶⁹ On efficacy, an audit of 23 symptom checkers by Semigran et al. found that their diagnostic accuracy stood at only 34%.⁷⁰ The authors also pointed out that while they were 80% effective in triaging users in emergency cases, their capacity to triage accurately in non-emergency and self-care cases stood at only 55% and 33%, respectively. This variability is also supported by findings by Millenson et al., who note that mobile apps for specialised services such as inflammatory diseases performed poorly, with some exceptions for those that also used sensors.⁷¹

When it comes to the general treatment and management of health conditions, a more favourable picture starts to emerge, especially when intervention includes telemedicine. Evidence on clinical outcomes for the remote management of COPD is associated with an overall improvement in health when compared with the control group, with fewer visits to physicians and nurses.⁷² A digitally-enabled self-reporting

Tackling the emerging threat of diabetes

In Japan, 10 million people are at risk of developing diabetes. With people living longer, the rising cost of treating chronic illnesses (including diabetes) and a depleting demand for life insurance policies have compelled many life insurers to innovate in order to add value to the user experience and grow their market. In 2018, Nippon Life Insurance Company embarked on its first journey to integrate a diabetes prevention service with its life insurance solutions. By building on its relationship with 31 municipalities, the Wellness-Star trial programme was launched with 1,000 public sector workers using Nippon Life hospital as a launch pad to deliver services. Participants of the programme received advice on diet, devices to monitor activity levels and biomarkers, as well as remote counselling by a public health nurse. The trial lasted three months for each participant during the two-year research period and resulted in a notable improvement in average blood glucose levels from 105.7 at the beginning of the trial to 100.7 at the end. Building on this success, Nippon Life launched a full rollout of a diabetes prevention plan in July 2020.

Dementia prevention through digital health

Neurotrack, in collaboration with Dai-ichi Life in Japan, offers a novel tool to prevent and diagnose Alzheimer's and related conditions. Integrated with Dai-ichi Life's dementia insurance, Neurotrack enables policyholders to access a cognitive test lasting 13 minutes and generate a brain score using an eye tracker integrated with smartphones. This enables beneficiaries to monitor any developments at regular intervals. The app also offers a resource centre for users containing dietary advice, tools for stress management etc. to address the environmental factors associated with disease prevention. In the U.S., Neurotrack works with Prudential Financial to aid underwriting.

tool for lung cancer sufferers showed better survival rates through early detection and intervention,⁷³ and a study of elderly patients in progressive care units (PCU) supported by telemedicine in the U.S. showed notable improvement in PCU and hospital mortality, length of stay and costs.⁷⁴ This was supported by a systematic review by the U.S. Agency for Healthcare Quality and Research, which also found

telemedicine to be associated with positive outcomes in areas such as remote management of cardiovascular or respiratory diseases and behavioural health, although its effect in areas such as triaging was less obvious.⁷⁵ Others have found positive effects on asthma, diabetes, cancer and digestive disease management,⁷⁶ as well as obstetric and gynaecological outcomes.⁷⁷ A review by Beratarrechea et al.⁷⁸ of digital health in low- and middle-income countries covering interventions ranging from heart disease, asthma and diabetes management also showed positive results on clinical outcomes.

"As a group insurer, we are seeing that employers are increasingly opting for telemedicine to avoid cases presenting in doctors' offices. From their perspective, it also has a direct effect on absenteeism by bringing more convenience to employees. In many parts of the Middle East, this has been a go to option because primary care infrastructure is still weak." (Insurer)



Smartwatch user

A review of reports from the insurance companies of GA members also confirmed this pattern. A mix of teleconsultation, activity tracking and biosensing for a diabetes prevention trial in Japan among 1,000 civil servants showed improvement in blood glucose levels in nearly 70% of the trial participants.⁷⁹ A reward-oriented AIA Vitality programme incorporating components of digital health in six Asian markets with 40,000 insurance policyholders who underwent regular health checks showed consistent improvement in NCD-related biomarkers: 21% of policyholders saw an improvement in BMI, 53% in blood pressure, 39% in cholesterol levels and 75% in blood glucose levels.⁸⁰

Alongside physical illnesses, digital health that tackles mental health is also growing. In a study of 73 mental health apps, Larsen et al. found that only one or two backed up their claims with credible evidence.⁸¹ The authors also note that the most common claims had little to do with clinical effectiveness and more about improving knowledge among users. More alarmingly, a study of 69 mental health apps targeting depression and suicide prevention by Martinengo et al. found that six apps provided invalid crisis helpline numbers, some of which were downloaded more than two million times.⁸² These gloomy findings are countered by Chandrashekar who draws attention to a meta-analysis of 18 RCTs on 22 mobile apps focused on depression that found a positive effect on depressive symptoms.⁸³ However, the effects were more pronounced in users with mild to moderate symptoms. The review also observed encouraging effects on anxiety when mobile apps were combined with face-to-face consultations, as well as managing the symptoms of schizophrenia, which was associated with improved adherence, user experience and broader clinical benefits. This favourable evidence is supported by findings from Batraand et al., who found mobile apps to have a positive effect on people with serious mental illness in the short term,⁸⁴ and Kumar et al.⁸⁵ in their 12 month pre- and post-pilot study that associated virtual mental health programmes with improvement in cognitive functions, depression and anxiety.

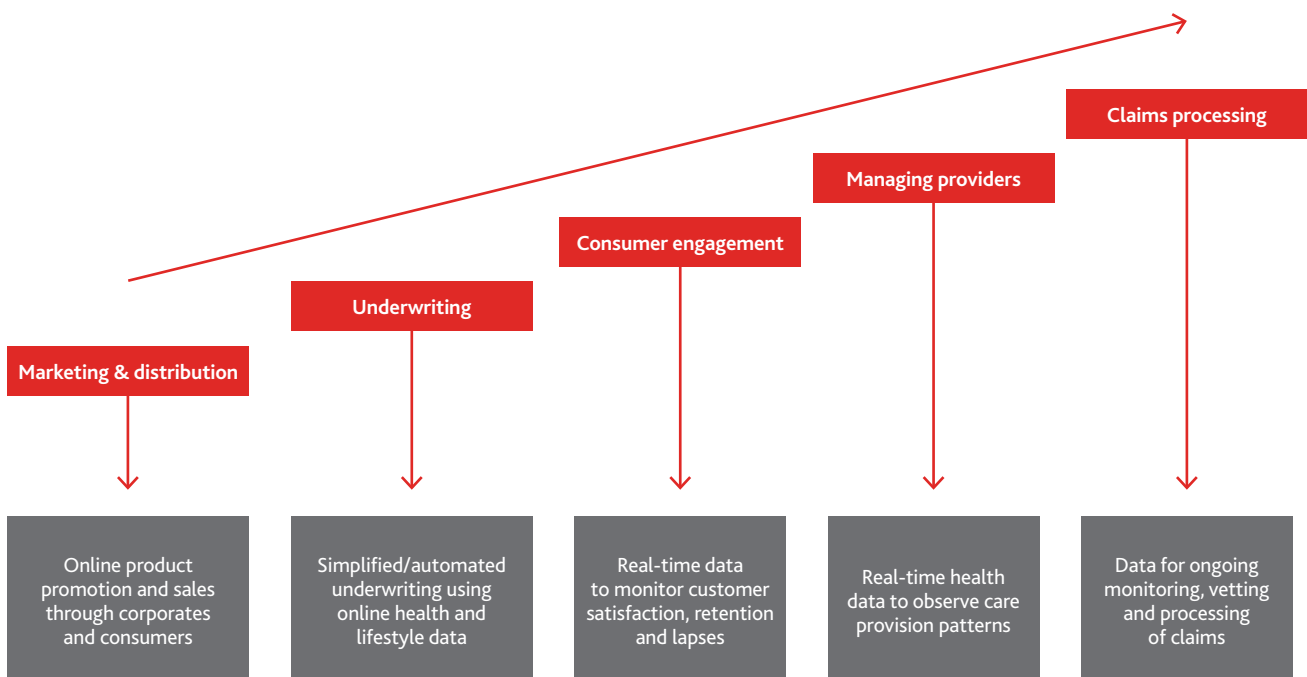
As for behavioural impacts, the evidence on whether digital health improves health outcomes is inconclusive. While there are indications of its effectiveness in the management of certain chronic and mental health conditions when combined with incentives and physical consultations, triaging capacity and diagnostic accuracy remain dubious. Similarly, the lack of research focused on high-risk and high-cost populations makes it harder to assess the long-term benefits to consumers and payers.



5. Digital health: Relevance for health and life insurers

Having explored the evidence on the clinical effectiveness of digital health, in this section, the ways in which digital health is influencing health and life insurance are considered. First, a simple insurance value chain – the entirety of functions ranging from insurance policy sales to claims payment – needed to create a seamless interplay between consumers, providers and payers to produce services is outlined (see Figure 7). Where possible, each stage of the value chain (while acknowledging that these stages are interlinked) is explored through the limited literature available. Any gaps in understanding are filled with expert input and findings from an online qualitative survey of insurers and providers from a number of countries.

Figure 7: The maturity of digital health applications across the value chain



Source: The Geneva Association

5.1. A value chain perspective

Voluntary health and life insurers face an inherent challenge from informational asymmetry leading to adverse selection, whereby consumers who are more prone to risks buy coverage and the healthy opt out.⁸⁶ This often leads to a rise in the average risk borne by insurers. It may be possible for digital health to help counter these challenges

to some degree. From a value chain perspective, some insurers may use more targeted online marketing and distribution to attract previously untapped cohorts to achieve more balanced risk pools. Others may apply greater precision in underwriting using data provided by digital health to provide transparent and adequate coverage to those more at risk of ill health. While there is a scarcity of evidence examining the impact of digital health on information asymmetry and adverse selection, early trials and operational literature from some GA member companies hold some signs of promise.

Early signs of adoption of digital health suggest an increase in the volume of sales through added-value services.

As discussed in the previous sections, the role of digital health in life and health insurance is mostly concentrated on **marketing and distribution**, and often aimed at consumers directly to improve their experience through new products and better services. Early signs of adoption of digital health suggest an increase in the volume of sales through value-added services. For instance, pairing existing dementia insurance products with a preventative eye tracking mobile app helped Dai-ichi Life monitor the risk of dementia among policyholders as well as meet its sales target just six weeks after the programme was launched in 2018.⁸⁷ For Ping An, the expansion of its online health portal, Good Doctor in China, resulted in 66.9 million active users on a monthly basis and a more than 50% increase in revenue in 2019.⁸⁸ Similarly, a collaborative programme by AIA and Vitality in Asia that started in 2013 with just two markets has to date expanded to 10, with a 50% growth in AIA's sales since 2017.⁸⁹ Data from Singapore, Thailand and Hong Kong also showed that AIA Vitality members were more likely to repurchase insurance compared to non-vitality members (by 53%, 11% and 63%, respectively), thus the programme also has a positive effect on **consumer engagement**. In Thailand, the data point to a 10% improvement in lapses and 32% improvement in premiums lost.⁹⁰ For Vitality U.K., the figure stood at 50% fewer lapses.⁹⁰

Underwriting in health and life insurance is a time-intensive process requiring extensive paperwork and a physical examination of applicants. It may also have a negative effect on consumer experience and engagement, depending on the speed and nature of the application. For instance, a trial by Aegon insurance attempted to shorten the process by mapping the typical questions asked by an insurer against the U.S. National Center for Health Statistics to understand the risk of mortality against the national data set.⁹¹ Only 10 questions emerged as 'significant predictors' for mortality besides gender and age. In many cases, physical examination also proved to be unnecessary unless the applicant belonged to a

Dacadoo: The convergence of life insurance and digital health

Founded in 2010, this patented virtual health score platform is based on 300 million person-years of clinical data. The platform generates a holistic and independent health score, integrating data on consumers' health with their mental well-being and lifestyle (such as activity, nutrition, sleep and stress). The score serves as a proxy indicator for a consumer's health status that is used to design personalised insurance solutions to incentivise a better lifestyle.

Today, Dacadoo's health score platform serves some of the leading life and health insurance operators globally as a B2B to track consumers' health in real-time. The platform also engages consumers directly through an AI-based lifestyle navigator, which has 4,000 healthy rules around activity, nutrition, sleep, stress etc. and is supported by its own risk engine, which scores mortality and morbidity in real time. By combining the 'classic' life tables with real-time lifestyle data, the programme enables insurers to bring more granularity to their understanding of risks associated with poor health and lifestyle, and thereby create not only classic life insurance products but lifestyle-driven policies.

Conditional underwriting in Brazil

Winsocial, a Brazilian startup in partnership with Mongeral Aegon, offers renewable life insurance to diabetic consumers in return for maintaining a healthier lifestyle and blood glucose within recommended limits, often at discounted premiums. Application for coverage is through a mobile app. The agility of the product has led to a wider spillover effect, with more non-diabetic users joining the programme and thus growing the market with an innovative value proposition.

Automated underwriting in Singapore

MetLife's Vitana programme has initiated a blockchain-based insurance solution to cover gestational diabetes in pregnant women. The solution automatically and securely connects with medical records through an app for parametric underwriting with instantaneous feedback on eligibility and an automatic payout on diagnosis, without the need for a manual claims process.

certain risk threshold. These early findings may pave the way for digitalising and fast-tracking life insurance applications using pre-determined risk thresholds for the vast majority of consumers. Linking life and health insurance underwriting to wearables and sensor data may bring additional benefits; for instance, data from the Aegon trial also showed that the risk of death is 88% higher in those who exercise less than one hour a day compared to those with active lifestyles. In the same vein, a Munich Re study found that besides routine indicators such as age and smoking status, the number of steps taken per day was the second most important indicator for understanding mortality risk for any person under the age of 65.⁹² As such, some life insurers are testing the use of sensor-supplied data to bring more granularity to their underwriting techniques as well as incentivise healthier lifestyles and grow their market through a previously untapped cohort.

"We don't have access to detailed medical results unless there is a query on a claim, so the right to access data from wearables, teleconsultation etc. is difficult." (Insurer)

Digitalisation can also have multiple effects on **claims**. With an increase in preventative care, insurers may see longer-term benefits in terms of number of claims, as well as advantages associated with employing digitally-enabled simpler claims processes. In addition, claims data can be used to scrutinise the utilisation patterns of consumers as well as the undersupply or oversupply of care to actively **manage providers**. At present, however, there is a lack of publicly available literature that directly links digital health to impacts on health and life claims or the management of care provision. The absence of the latter may be a direct consequence of the challenge posed by data silos, meaning neither the insurer nor the provider has access to joined-up data sets to enable them to buy or supply care more strategically. As such, commentators point out that a shift to strategic purchasing of care can only happen when *'more interoperability is realized'*.⁹³

"Just imagine that 10 diabetic patients are offering the same doctor their blood sugar readings on 10 different apps? It cannot work." (Insurer)

A review of the non-academic literature, while limited, suggests some positive effects of digital health on claims and costs. The Vitality programme has shown a persistent improvement in mortality by more than 50% for highly

engaged policyholders as well as 15% lower medical costs and a 4% lower loss ratio.⁹⁴ Other studies have associated the programme with reductions in admission rates (10%) and the length of hospital stays (25%) in South Africa, where the programme has been operational for nearly three decades.⁹⁵ Similarly, in the U.K., the programme showed a 44% decrease in claims cost if engaged members exercised five days a week compared to one day.⁹⁴ In a more recent study, the programme noted substantially lower claims from highly engaged members for cancer, gastrointestinal diseases and CVDs in particular.⁹⁶ While the programme is not exclusively digital, its incorporation of an online and offline care mix with incentives may explain some of these efficiencies. Early evidence from low-income settings where the health protection gap is substantial also appears to be favourable. For instance, through the integration of AI-supported telemedicine and microinsurance, Telenor Health in Bangladesh has lowered the average length of the claims payment process to eight days compared to 50 days (market average) with a loss ratio of 55%.⁹⁷

However, the broader literature alerts us to other possible scenarios. In a study of 35,000 patients in a Massachusetts-based Accountable Care Organisation (ACO), Cohen et al. found that virtual care reduced the need for physical visits in the early phases of implementation by as much as a third, but the results were not sustained beyond a year.⁹⁸ Moreover, it led to an 80% increase in overall care episodes (both virtual and physical). The authors' focus on neurological services may be one reason for this weakening demand for virtual visits over time as services such as these may require complex, face-to-face intervention compared to simpler routine checks. Moreover, in an environment where fee-for-service is the most prevalent form of reimbursement, such as the U.S., there may be little incentive for providers to curtail physical visits or to moderate the overall volume mix of online and offline care, thus causing the insurer to reimburse more over time. Similar patterns have been reported in Germany for a heart failure programme, where early improvements in hospital utilisation in a low-risk population aided by telehealth were not sustained over time and led to an overall increase in admission and healthcare costs. However, the initiative did have a positive effect on mortality.⁹⁹

In an environment where fee-for-service is the most prevalent form of reimbursement, such as the U.S., there may be little incentive for providers to curtail physical visits or to moderate the overall volume mix of online and offline care, thus causing the insurer to reimburse more over time.

Notwithstanding the limited evidence, some explanations for these results may lie in the ecosystem factors in which the programmes operated. For instance, substantial change in the claims costs of health and life insurers from digital health may only be realised when due consideration is given to the nature of services it is used for (routine vs. complex that require in-person intervention), the target cohort, provider incentives and the length of time the programme has been operational. It may also be the case that overall utilisation rises initially because digital health is better able to identify previously undiagnosed cases where intervention would be necessary. Regarding the digitalisation of other claims processing functions, blockchain technology has enabled simpler claims processing and fraud detection for life insurers¹⁰⁰ and is estimated to improve the consumer claims handling experience by 20% and claims expenses by almost 25–30%.¹⁰¹

5.2. Online survey results

To complement the findings of the literature review, an online survey was designed and shared with 11 insurance companies and 20 digital health providers using a purposive sampling technique. The survey was live between 31 August and 16 September 2020. Health providers were included in the survey to explore perceptions and assess gaps in the market. Overall, the survey results confirm most of the findings from the literature review.

"Our overall goal is to improve access to quality healthcare. This is achieved through leveraging technology as an enabler of healthcare and coupling it with expert physicians on a global basis." (Provider)

5.2.1. Digital health strategies and opportunities

The insurers with a digital health strategy (64%, n=7) mainly focused on growth and diversification and improving customer experience. In the case of providers, all of whom had a strategy (100%, n=20), the majority focused on customer experience (n=16) and growing market share (n=14), thereby confirming the trends seen in the literature.

Most insurers felt that digital health was a priority and had the potential to complement their existing activities.

"Digital health is allowing us to transform from being a claims payer to a health and well-being partner for our members. By capturing data from wearables and other devices, [we] can track the health of its members and provide care and prevention advice in real time. By pre-empting health risks, [we] will not only help members stay fit but will also save huge costs involved in the treatment of certain conditions." (Insurer)

What opportunities did insurers feel digital health can offer?

- Increase growth and penetrate untapped markets (including geographic reach)
- Improve customer experience, satisfaction and loyalty
- Expand customer user base, new distribution and sales channels
- Bring health into people's daily lives
- Real-time, accurate data collection
- Agile ways of working, allowing swift responses to opportunities and challenges
- Cost reduction
- Claims management/control
- Product diversification, addressing gaps and collaboration with new stakeholders to develop additional products and services

Source: The Geneva Association

Insurers were asked to identify up to 10 problems digital health was solving or problems they would like it to solve in the future (Table 3). Overall, the results aligned with the findings of the literature review, with insurers focusing on NCDs (mostly obesity, diabetes and cancer) and well-being. Insurers gave a wide range of responses, predominantly on addressing health issues and promoting wellness (which may indirectly prevent/reduce NCDs, e.g. step-monitoring apps), with only a few highlighting how digital health could support the financial aspects of insurance or the potential of data management in products and services.

Table 3: Problems that digital health can help solve

Theme (# responses)	Problem (# responses) ^e
NCDs (17)	Obesity (3); diabetes (3); cancer (3); dementia (2); heart disease/cardiovascular (2) hypertension (1); hyperlipidaemia (1); asthma (1); cerebrovascular (1)
Health (19)	Disease management (2); disease prevention (2); health advice and guidance (2); pregnancy support (2); COVID-19 health counselling (2); critical disease (1); orphan diseases (1); primary care (1); treatment follow-up (1); health information (1); chronic disease (1); musculoskeletal (1); online GP consultation (1); telemedicine (1)
Mental health (11)	Well-being (3); anxiety (2); stress (2); mental health areas unspecified (2); depression (1); early detection (1)
Lifestyle (11)	Healthy lifestyle (2); physical activity (1); nutrition (1); sleep hygiene (1); alcohol (1); addiction (1); healthy ageing (1); environment-related diseases (1); behavioural change (1); eating disorders (1)
Data (5)	Data sharing (1); digital payments (1); fraud management (1); external parties (1); customer analytics (1)
Other (9)	Access to advice (2); medication delivery (2); second opinion (1); personalised plan options (1); convenience (1); one-stop platform (1); healthy workplace (1)

Source: The Geneva Association

Several respondents, both insurers and providers, touched on the impact that the COVID-19 outbreak is having on the provision of digital health. Most felt that the pandemic has accelerated the growth and adoption of digital health, particularly telemedicine, but some were uncertain about the sustainability of the environment following the end of the outbreak.

5.2.2. Current digital health platforms

Almost three quarters of insurers (73%, n=8) and 85% (n=17) of providers currently have a digital health platform. Five of the eight insurer platforms (63%) provide multiple services. Of those with a platform, the dominant focus for both insurers and providers is

NCDs (including diabetes, cancer, cardiovascular and respiratory diseases and dementia). All insurers' platforms (n=8) provide wellness and protection services. Of the provider platforms, the vast majority (88%, n=15) provide treatment and management, with 12 also providing wellness and prevention services (71%).

Both insurers and providers highlighted a range of other services their current platforms provide to users. For the insurers (n=7), these included healthy lifestyle and well-being support, insurance protection and health and condition management. For providers (n=11), platforms focused on diet therapy, general medicine/primary care and pre-hospital care, dermatology, traditional Chinese medicine, obstetrics, paediatrics, urology and adverse drug reactions.

Figure 8: What is the target age group?

Number of digital health products per age group



Source: The Geneva Association

^e As insurers were asked to identify a list of problems, the total number of answers add up to more than 11. We have also presented raw data without bundling some of the areas to avoid misinterpretation.

The older population is the main driver of insurance costs, as individuals in this category are most at-risk of NCDs. Without effectively involving them in digital health, potential cost reductions are likely to be limited.

The target age groups reported by both the insurers and providers (Figure 8) are in line with the findings from the literature review. The majority of respondents focus their digital health product towards younger populations (under the age of 55). The older population is the main driver of insurance costs, as individuals in this category are most at-risk of NCDs. Therefore, without effectively involving them in digital health, the potential cost reduction is likely to be limited. That said, if insurers and providers aim to pivot towards ill-health prevention and behavioural change, long-term health benefits may be derived from targeting young people and maintaining contact throughout the lifespan. Providers in the survey identified the need for a blended health package – a combination of digital and offline services – as there are some areas/conditions that will require in-person diagnosis and treatment, in keeping with the findings from the literature.

5.2.3. Digital health influence across the value chain

Both the literature review and the survey responses from insurers and providers suggest that, to date, the uptake of digital health required to benefit a broad array of insurance functions appears to be limited.

Marketing and distribution

Insurers most frequently reported that digital health had enabled them to improve their marketing and distribution, including efficient targeting of consumers (n=10, Figure 9). While this is a start, there is an opportunity for digital health to have a broader impact on activities and products, as identified in the preceding sections.

Consumer engagement

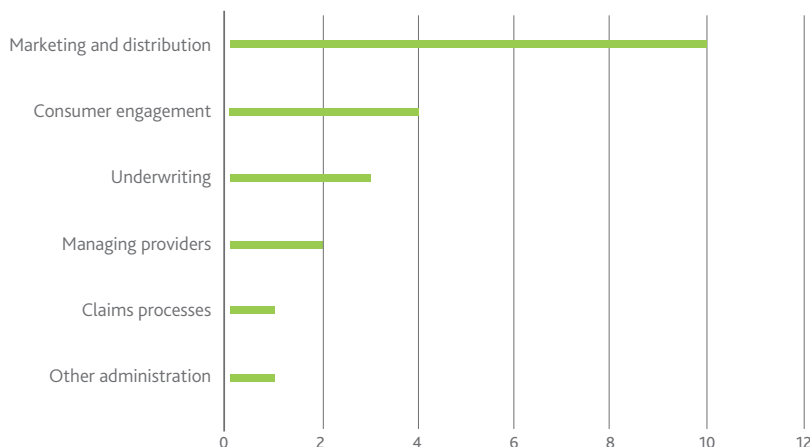
Most providers felt that digital health had not yet been optimised across the patient journey. This is because healthcare is heavily reliant on integrated systems. Providers highlighted a lack of integration, as well as disjointed systems with breakpoints between apps, human clinicians and health services, as ongoing challenges. One respondent felt that most digital health solutions have been just a substitution for existing, paper-based healthcare.

Others were more optimistic, feeling that it is a work in progress, and as healthcare stakeholders become more comfortable with digital health, adoption will increase. However, several providers highlighted that insurers and other stakeholders are slow to adapt, which has meant that the usage and uptake of digital health is still low. As one Hong Kong-based provider states:

"In Hong Kong, digital health is an evolving area of development. Various tools and systems have been developed by start-ups and established players in the market, but few have yet been substantially adopted in the wider market." (Provider)

Figure 9: How did insurers perceive the impact of digital health across the value chain?

'Digital health has helped us to improve...'



Source: The Geneva Association

There are significant opportunities, especially in integrating multiple providers, for providing a centralised system where consumers can manage their health data and information. However, as with any new technology, systems integration takes time. Echoing the findings from the literature review, providers emphasised the need to incorporate incentives and motivation to bring about lasting health improvements and behavioural change. The need for a shift towards patient-centred, tailored healthcare was also noted by several providers.

"Patients want to be informed, engaged, and connected to all the stakeholders within the healthcare system in order to become an expert in their treatment pathway. Therefore, healthcare providers will need to focus more on how to become customer-driven, placing the patient at the centre of his or her own medical journey." (Provider)

The few providers who felt that digital health has been optimised in practice mentioned the round-the-clock availability of services, accessibility of online information, reduced waiting times and increased accuracy of triage as strengths.

Underwriting

Underwriting effectiveness was rarely mentioned by insurers (n=3 Figure 9). This mismatch between the survey responses and the innovative opportunities outlined in the literature may be reflective of the fact that insurers might have other priorities when it comes to digital health. It may also reflect the challenges posed by data interoperability outlined in the literature and the need for new talent and comprehensive investment in time and human resources to make a substantive move in this direction.

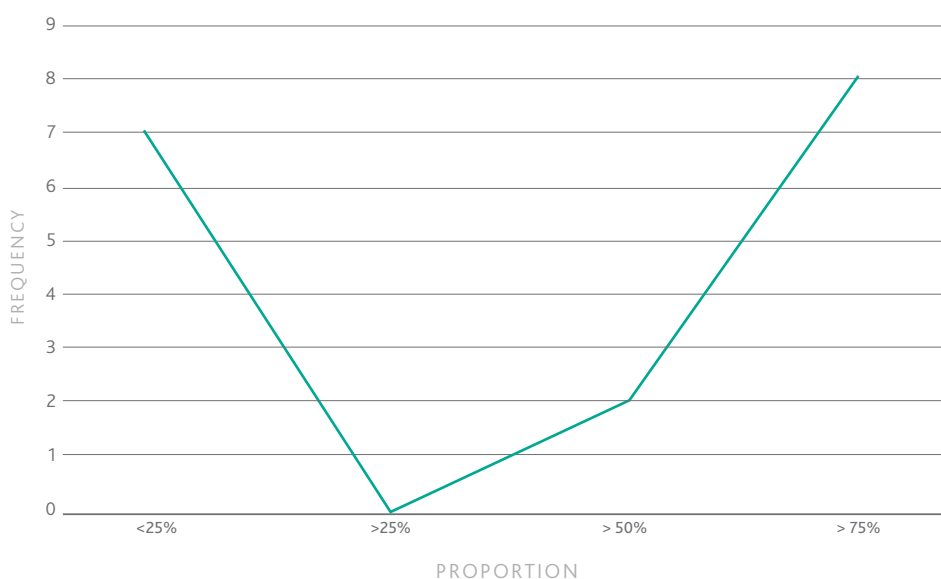
Managing providers and claims processes

While around two thirds of insurers (64%, n=7) felt that digital health offered the services they needed, almost all providers felt that the utilisation of digital health has not yet been optimised (80%, n=16). Insurers who felt that current digital health initiatives did not offer the solutions they wanted highlighted difficulties in adapting products to different contexts and turning a concept into an enterprise-wide solution, and challenges in finding solutions that do not require the involvement of the national healthcare system.

Most providers' platforms were paid for by insurers (n=14) and used a fee-for-service model (n=11). The risks of this model, discussed in the literature review, include the fact that providers are likely to prioritise revenue maximisation and there is little incentive for reductions in or rationalisation of in-person visits. This generates an increase in both physical and virtual care, leading to overall growth in utilisation.

Figure 10: Who pays for digital health?

Proportion of provider revenue reimbursed by a third party



Source: The Geneva Association

If providers are targeting users directly, there are few opportunities to vet solutions, such as those conducted by third-party payers, to ensure product standards. Consumers may therefore be exposed to poor-quality, ineffective products.

Providers either had most of (>75% n=8) or little of (<25% n=7) their revenue reimbursed by a third party (Figure 10). Such polarisation raises concerns around the quality of available digital health products. This was one of the central findings of the literature review, particularly for mental health platforms. If providers are targeting users directly, there are few opportunities to vet solutions, such as those conducted by third-party payers, to ensure product standards. Consumers may therefore be exposed to poor-quality, ineffective products. There are also repercussions for cost inflation as consumers are at risk of more OOPs where providers directly charge users.

Similar to underwriting, the impact of digital health on claims was rarely mentioned by insurers, and improving the claims ratio was highlighted only once as a potential impact of digital health on the value chain.

5.2.4. Barriers to digital health

Survey respondents were asked what they considered to be the barriers and risks to the effective implementation of digital health. Barriers were identified from both internal and external perspectives. There were commonalities between responses from the providers and insurers, several of which were also reflected in the literature review. However, there were also marked differences in perceptions in some cases.

"Insurance companies have been known for their traditional ways of working and bringing a change in processes and shifting organisational culture to agile ways of working is challenging." (Insurer)



Telemedicine consultation

Internal barriers	
Insurers and providers	
<ul style="list-style-type: none"> Challenges around resources and budget restrictions. Providers felt that there was a lack of understanding of the importance of digital health; insurers mentioned resistance to change from some stakeholders and challenges in changing mindsets. Legacy systems pose barriers to the rollout of new technology and the costs of migrating and integrating systems. 	
Insurers	Providers
<ul style="list-style-type: none"> Distribution readiness, slow adoption by distribution channels. Product integration, lack of standardisation/integration between processes and IT interfaces and the absence of digital engagement platforms from leading insurers. Data analytics, secure data management and maintaining data integrity and accuracy in migration. 	<ul style="list-style-type: none"> Appropriate revenue generation, payers underpaying solution providers: 'partners want a 'mansion' but are only willing to pay for a 'shack'.' Misaligned interests amongst providers create disincentives to work together. Risk-averse culture of insurers/organisations. Conservatism of physicians, lack of understanding of digital health in the medical community. Technological delay of the industry, with immature technology in some areas.

Source: The Geneva Association

External barriers:	
Insurers and providers	
<ul style="list-style-type: none"> Lack of confidence and trust in digital health, particularly among older people. Inclusion of older cohorts, who are more likely to require health services. Regulatory frameworks and a lack of clarity limit digital health services. National governments are slow to respond to the new digital health environment. Increased demand for non-contact health services during the current pandemic may drive changes to government policy, but this is by no means certain. 	
Insurers	Providers
<ul style="list-style-type: none"> Access to data, data sharing and security concerns for customers. Healthcare providers tend to lack data-sharing/protecting capabilities. Consumer expectations are driven by experience in other industries (retail/entertainment). This may create a perception-reality gap for consumers if the product does not deliver a similar experience. Entering new and emerging markets where a proportion of the population does not have internet access. 	<ul style="list-style-type: none"> Lack of reimbursement/challenges in current payment models for services that do not reflect the true costs. Payers prioritise cost-saving over patient outcomes. Lack of alignment between medical provider and insurer/payer for efficient patient care. Fragmented market with many digital health providers in competition. Lack of integration, inflexibility of external partners.

Source: The Geneva Association

"Despite digital progress made within healthcare, the current reimbursement system is based on a fee-for-service following a face-to-face meeting with the clinician. This leads to a paradoxical situation since new technologies reduce face-to-face interactions whilst the current reimbursement system urges the opposite." (Provider)

"For large scale digital health adoption, it will be critical to ensure that patients will be reimbursed, physician time is appropriately valued, and health insurers will provide consistent reimbursement in a timely manner." (Provider)

5.2.5. Risks of digital health

Respondents were asked what they perceived to be the risks of digital health adoption	
Insurers and providers	
<ul style="list-style-type: none"> • Data issues, including security and potential attacks/breaches. • Potential complaints about the handling of personal information. • Inadequate safeguarding practices. 	
Insurers	Providers
<ul style="list-style-type: none"> • Digital health systems may be highly complex, and so there is a risk of coordination issues in the system. • If the system is a single source, disruption in one part of the business can put the entire value chain on hold. • Workforce transformation and adoption of technology may not happen at the same speed as the digitisation of business processes, which will exacerbate over-utilisation of resources. 	<ul style="list-style-type: none"> • Digital health lacks the human touch of medicine. Some conditions require in-person diagnoses and treatment. Digital health should not replace the doctor-patient relationship. • As the barriers of entry become less challenging, more companies will enter the digital health space. There may be an increase in the number of companies who market products that are not based on proven science.

Source: The Geneva Association

"The largest single risk is that the classic operators have not been moving forward fast enough and the big digital brands such as Amazon, Apple, Facebook and Google will most likely take a very large part of the global 'private' life and health premium, as they will integrate their digital brands around new insurance products." (Provider)



Portable self-testing device for blood coagulation



6. Recommendations: Where to go from here?

This report poses three fundamental questions: 1) does the insurance industry address the informational asymmetry in the digital health market; 2) does it have a holistic strategy to embrace digital health; and 3) does it have the capacity to roll out digital health? Our preliminary conclusions are sobering and a little provocative. With countless apps, telehealth solutions and sparse evidence of effectiveness, the market remains fragmented. This makes it hard for consumers to get the quality signals they need to choose effective products and for payers to steer away from ineffective solutions. The literature review and survey results also indicate that the majority of players are yet to adopt a holistic approach towards digital health. It may therefore be fair to infer that digital health still has some way to go in terms of delivering quantifiable benefits on a larger scale by going beyond the young and the healthy. Successes in distribution and marketing, with some incremental adaptations of insurance products, are evident; however, they are far from being transformative. To address this, we propose six areas where insurers, at both the company and industry level, can shape the digital health market to optimise its societal benefits alongside realising new business opportunities.

Articulate a holistic digital health strategy

At present, there is no resounding vision that emerges from the literature that clearly articulates how health and life insurers need digital health and vice versa. Evidence also suggests that the overall maturity of using digital health across the value chain remains low and while there are innovations, few have achieved scale. Amidst the COVID-19 crisis, health systems globally came under renewed pressure to adopt digital health. It is therefore important to get past the euphoria of gadgets and appraise more holistically the business and societal opportunities that arise from digital health for insurers to enable them to add value to the consumer experience while also driving efficiency.

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Is digital health a tool to aid marketing and product distribution to previously untapped cohorts, or could it be used to add value to the lives of older or high-risk consumers? While focus on the young, general prevention and wellness is welcome for longer-term gains, most societal and claims costs are attributable to the long-term management of conditions. What can insurers do to achieve the integration of prevention and management solutions? These are just some of the high-level questions that require workable solutions at the company level.

Marshal the evidence prior to purchasing digital solutions

The insurance industry is in a strategic position to drive the digital health industry toward impactful products and services through purchasing power. While the lack of longevity of many digital initiatives discussed in this report impedes us from drawing any clear-cut conclusion about their long-term impact, having clarity on what changes insurers would like to see and taking steps to measure them are important places to start.

Impact should be considered in terms of value to consumers and payers. This includes clinical outcomes, cost of care and access to care, and not just care episodes. In order to be impactful, digital health providers should clearly articulate, study and report on the specific conditions and populations they seek to impact.

Insurers can move away from being passive claims payers to strategic purchasers of services only by associating with digital health products that demonstrate prior and ongoing clinical and economic impact. There are two dimensions to achieving this goal. Firstly, insurers need to devote more time to detailed claims analysis so that digital services can be targeted to achieve the best outcomes for both the customer and the insurer. Secondly, they can work with digital health companies and academics who have already set out novel means of collecting, studying and reporting on the impact of digital health solutions.¹⁰² This would mark a significant shift from the sales or marketing focus that we see today and would require insurers to be more clinically-led than they are currently.

Align payment incentives for digital health providers

Digital health providers already face strong incentives to innovate to sustain themselves in this dynamic market. Market forces alone, however, would not be sufficient to steer services to the right people and places or towards greater efficiency due to well-known market failures in healthcare. Evidence shows that while people above the age of 55 drive most healthcare costs, digital initiatives supported by insurers or providers mainly focus on younger cohorts. Equally, there are some indications that digital health alone may not be enough to lower unnecessary face-to-face visits, especially in a fee-for-service environment.

Attention should also be given to creating the right reimbursement model that works to optimise an online-offline care mix to increase clinical and cost efficiencies.

Market forces alone will not be sufficient to steer services to the right people and places or towards greater efficiency.

Many payers globally have embraced innovation in payment methods to tackle supplier-induced demand or risk selection in health. Performance-based payments have been in use to improve the quality or incentivise volume for a defined set of services. Similarly, capitated global budgets or bundled payments are in use in many European health systems to tackle oversupply. Can insurers adapt these reimbursement models for digital health applications and shift away from the current dominant fee-for-service payment model? If digital health service providers begin to share some of the risks of rising health costs through global budgets or bundled payments, they may be incentivised to develop more efficient service offerings. Similarly, developing metrics that capture both the economic value of digital applications and the health and convenience benefits for consumers could help insurers negotiate prices more effectively and fairly.

Prioritise trust through voluntary charters

The future growth of digital health applications is largely dependent on the willingness of consumers to share private data, often of a sensitive nature. There are already examples of regulatory standards that aim to improve the effectiveness and data governance of and enhance trust in digital health. These include the precertification programme by the U.S. Food & Drug Administration or the Evidence Standards Framework for Digital Health Technologies in the U.K. developed by the National Institute of Clinical Excellence. The insurance regulatory community is also honing in on the use of new technologies, such as algorithms and Big Data Analytics (BDA),¹⁰⁴ to define risk categories and prices and there are a plethora of regulations that vary by jurisdiction. However, voluntary data sharing through mobile apps remains a grey area.

While regulatory initiatives may be a step in the right direction, these initiatives alone will not be the 'ultimate trust builders'. A survey conducted by Harvard Business Review¹⁰³ indicated that '*trust is an essential facilitator*' for firms to '*earn*' access to customer data and pointed out that being open and transparent is likely to influence the extent to which providers or applications are trusted. A possible approach is a combination of the industry's

compliance with relevant privacy and data protection regulations with the development of voluntary charters that puts consumers at the centre. These could be implemented at the country, regional or global level and act as a starting point for agreeing on some ground rules related to privacy, transparency, societal well-being and accountability that insurance companies can endorse and use to differentiate themselves from the rest of the market. Such charters could also constitute a platform to involve, sensitise and communicate with consumers.

Recognise organisational context and improve capacity

While the industry recognises the importance of health and wellness data for customer impact and product design, the position of each insurer on its path to digital transformation needs to inform goals, approach and timelines. That way, realistic expectations can be set. Organisational impediments and support systems need to be considered. For instance, what kind of talent is required to bring together a more joined-up approach to health and life insurance products through digital health? What levels of IT budget and resources are available? What is the current approach to data structure and interoperability and is there a single point of data and analytics management? How is the underwriting and pricing organisation structured and what is its openness to new data sources? Limitations arising from data governance and issues related to interoperability and standardisation are highlighted consistently in the report. Solving these would require well thought through collaborations with governments and providers, as seen in countries like Estonia. Prior to that, as a stepping stone, insurers will need to consider the barriers and desired solutions internally in order to initiate a broader dialogue.

In addition to the above, channels and products would also require new ways of thinking. Health and wellness data are very relevant in a competitive context of simplified products and a direct-to-consumer market but less so for complex products that have an investment angle and are sold through agencies, banks or brokerages. For instance, what would a digital interface look like with intermediaries? Related to this, critical issues such as cybersecurity and data protection need to be properly analysed and not bypassed to make a stepwise change in the ecosystem.

Create a digital health market place

The gap created by slow economic growth and high medical inflation, exacerbated by COVID-19, will bring added pressure to public spending on health. At the same time, most evidence suggests that digital health solutions – notionally aimed at improving access, affordability and efficiency – are fragmented and lack scale and reliable data to measure their efficiency and effectiveness. While there have been pilots there is

limited progress with data sharing, which makes it harder to drive out ineffective solutions from the market.

It is now timely for insurers to convene key stakeholders such as governments, investors, providers, health tech companies and pharmacies and set up a collaborative platform for a nuanced approach to digital health – one that respects competition but does not reduce quality. The health and life insurance industry, in collaboration with others, can unlock significant value by creating a 'digital health marketplace' that brings relevant digital and in-person solutions (e.g. symptom checkers, telemedicine, appointment booking for in-person visits) together, keeping outcomes at the core and focusing on quality at affordable cost rather than just utilisation. This shared market place can facilitate a much needed rationalisation of products by creating common standards (e.g. a health outcomes database), effectively leveraging experiences and offering a unified voice while working hand-in-hand with governments on crucial topics like data and security and keeping a clear focus on customers' health needs.

The health and life insurance industry, in collaboration with others, can unlock significant value by creating a 'digital health marketplace' that brings relevant digital and in-person solutions together, keeping outcomes at the core and focusing on quality at affordable cost.



7. Closing remarks

Health systems are likely to undergo a forceful transformation in the aftermath of the COVID-19 crisis. At the macro level, the accessibility, affordability and adequacy of the health workforce will be central themes as both the public and private sectors respond to the pandemic. At a more personal level, a renewed understanding of physical and mental well-being in a life post-lockdown are likely to increase demand for services. Digital health innovations will have to speak to both layers while bolstering consumer confidence.

The digital health market is in its infancy, but it has already made a powerful case for its existence and importance during the crisis. It now warrants serious development through a holistic strategy and a consolidation of the market. Health and life insurers should not be seen as laggards. Instead, with digitalisation, they should be the trailblazers, contributing to slow the seemingly inexorable rise in healthcare costs by reducing fragmentation and proactively managing the risk of ill health among the insured. In order to do so, the industry needs to take stock of its vision and capacity internally prior to forging targeted collaborations with others to deploy interventions at scale.



Wellness app

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Demographic shifts, rises in chronic illnesses, the ongoing pandemic and squeezed public budgets mean health needs are unlikely to be met solely by a brick-and-mortar health system going forward. Digital health is increasingly seen as a solution. This report analyses the effects of digital health on health behaviour and outcomes and examines how digital health is being used by health and life insurers across the insurance value chain, providing recommendations for insurers on how to scale-up solutions.

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