MAPFRE

The health of the future

Five trends shaping
the future of the industry

INTRODUCTION

The future is being built **now**

With the pandemic not yet behind us, we are entering an era of recovery and economic growth in which the value of relationships and caring, both for ourselves and our loved ones, will remain high priorities. Over 70% of the Spanish population has expressed increased concern for their health since the pandemic began[1]. In the UK, 87% of HR executives say that mental health-related ailments have increased among their employees[2]. With the growth of both interest and of real need, it is essential to put health and wellness at the center of any strategy, whether it is individual, family, social or business.

However, the pandemic is not the only driver of change. First, the tensions in the healthcare system have led governments to demand greater efficiency and transparency from both public institutions and private providers, encouraging the necessary digitalization of the sector. Traditional players (healthcare groups, insurers, pharmaceutical companies, and medical device manufacturers) have also seen new arrivals (technology companies and digital giants such as Apple, Google, and Amazon) take an increasing interest in the sector.

In the midst of this hurricane, where is the consumer/patient? The rapid adoption of digital solutions by the general population has led to an increase in their expectations in terms of ease and immediacy. The growing interest in wellness has generated a demand that goes beyond traditional medical services. Empathy and trust have become key factors in ensuring our loyalty to healthcare providers. But with digital transformation only half-way complete and the stakeholder landscape highly fragmented, building holistic value propositions and delivering a seamless, homogenous patient experience seems like mission impossible.

On the following pages we will review the five trends that will mark the future of health, and we will do so based on a reading of the present: the movements of the main players, the maturity of new technologies and the views expressed by experts from around the world. Like practically all sectors, we are in the process of building a new paradigm that will undoubtedly benefit us all. But this process is not without challenges that require the collaboration of all parties. ■

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[1] Pic Solution: 4th Barometer on self-care in the Spanish population (cited by Infosalus).

[2] Accenture Digital Health Technology Vision 2021.

#1

Enthusiasm

Everyone in the race to conquer the sector

In recent years, the healthcare sector has experienced an unprecedented injection of liquidity. In 2021 alone, digital health startups received $31 billion in venture capital, up 60% from the previous year[3]. No one wants to miss out on a market that will reach $426 billion by 2027[4].

One of the main consequences of the entry of technology players is the very high specialization of the ecosystem. Startups begin with a very specific solution and, as in other sectors, in the years prior to the pandemic they mostly opted to integrate themselves into broader value propositions through alliances, as direct marketing requires a greater effort and they preferred to allocate those resources to technology development. However, in the last two years this approach has changed: the rise of telemedicine and investors' interest in the sector has cleared the way for the proliferation of B2C models. At the same time, investor interest has shifted from technologies aimed at improving the performance of medical providers (such as new forms of diagnostics) toward digital solutions dedicated to the consumer or patient. Today, this is the model for 86% of health startups in Spain, the country with the fourth largest number of startups in the sector globally[5].

Technology giants also see the health market as the next territory to conquer. In addition to its inherent technological capabilities, it has a close relationship with users—who spend several hours a day in its proximity—and proven expertise in creating value from data. What's more, players from sectors seemingly far removed—such as telecommunications—have also joined the race to become the "one-stop shop" for health.

Right now, the health sector is in a paradoxical situation: the more companies try to become a platform and build a close relationship with users, the more atomized the supply side is and the more difficult it is to create seamless experiences for customers. The necessary specialization of the actors suggests that the ecosystem will avoid concentration. On the contrary, it will consolidate on the basis of an infinite number of multidirectional alliances. ∎

[3] Digital Health Business & Technology: 5 digital health categories led VC investment in 2021.

[4] Global Market Insights: Digital Health Size by Technology

[5] IM Médico: The great revolution in the start-up world comes to the healthcare industry.

WATCH VIDEO

> **"** **Nicolas Monsarrat,** Accenture

I don't see the emergence of an 'Amazon' of health in Europe. There will be players of all kinds who will have to cooperate.

"The health market will increase fivefold in the next five to six years; as spending increases, so will investment. There is the data and its regulation, the medical devices, the underlying technology, and the orchestration layer that must ensure that all of this works. But at the heart of it all is the patient, and all players–large and small, public and private–must find their role in meeting the needs of a health system that's on the move."

THOUGHT

Can technology eclipse traditional players?

The acquisition of FitBit by Google, the certification of the Apple Watch and Samsung Galaxy Watch as medical devices, and the health services launched by Amazon (Amazon Care and Amazon Pharmacy) leave no doubt about big tech's appetite for this sector. In Spain, telecommunications companies such as Movistar and Yoigo have entered the world of telemedicine with Movistar Health and DoctorGo, respectively.

#2
Interoperability

The cornerstone of the patient experience

One of the many side effects of the pandemic has been the awareness of and legally mandated access to personal health data. While proof of vaccination was already required to enter certain countries before the pandemic, having to show a document with our full name and vaccination status to gain access to a restaurant or concert hall has stretched the limits of our right to privacy. All this while consumer confidence in privacy is at an all-time low: only 41% trust their healthcare providers' ability to adequately safeguard their data[6]. And despite the proliferation of consumer-oriented health devices (such as watches and activity wristbands), only 10% of respondents trust technology companies as guardians of the security of their health data.

Users' mistrust related to their data is partly due to the little value they receive for the use made of it. Unlike other sectors, such as retail or entertainment—where providing data enable enriched and personalized experiences—the potential of data is not yet generating tangible value for health users. And it's not for lack of willingness: 7 out of 10 consumers would be willing to share their health and exercise data in exchange for personalization and additional benefits on their insurance policies[7].

These limitations are largely due to the sector's lag in digital transformation and, above all, to the scattered and hermetic nature of health data storage: practically every medical center has its own system, amounting to an impenetrable silo. At the same time, the European regulation on data protection (strict and at the same time heterogeneous), while nobly protecting the rights of citizens, is de facto a barrier that is detrimental to both citizens and institutions.

The first wave of digitalization in health focused on hospital and institutional management systems. A second wave,

fueled by advances in artificial intelligence, triggered disruption in diagnostic and treatment assignment systems. The pandemic propelled a third wave, this time focused on the digitalization of the doctor-patient relationship (telemedicine). The fourth wave will have to break down information silos, driving standards to facilitate information exchange and upgrading technological infrastructures to make this possible in an efficient and (above all) secure way.

In the previous point, we noted that the sector would tend toward consolidating on the basis of alliances between specialized players. This will only be

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[6] Accenture: 2021 Health and Life Sciences Global Experience Survey – The ultimate healthcare experience.

[7] Accenture: Guide insurance customers to safety and well-being.

possible with data interoperability that can unleash the true potential of the information age in healthcare, enabling a seamless and homogeneous patient experience and exponentially driving the world of research. ■

WATCH VIDEO

❝ **Luís Martín,** CancerAppy

Just as we donate organs for science, we should start thinking about donating data for science.

"If you tell a person that the data that will be obtained from the course of their disease can be made available to science, I am certain they will agree to it. We might even be able to turn it around and fund that patient's treatment. They are very expensive treatments, so the data can be very valuable."

THOUGHT

Is Blockchain part of the solution?

Solutions based on distributed ledgers (DLT) and Multiparty Systems are beginning to position themselves as the best option to break down information silos. Consortia such as The Institutes RiskStream Collaborative and B3i are driving the transversal adoption of Blockchain in the insurance industry. In addition, companies such as TripleBlind and Incountry offer alternative solutions to traditional shared systems, safeguarding both privacy and regulatory compliance.

Empowerment

The user has the power. Will they want to use it?

Increasing social awareness of wellness and shrinking operating margins for health providers are driving the growth of preventive health services. At $320 billion in size, the preventive health market (both digital and non-digital) is expected to grow 7.8% annually, up to nearly $559 billion by 2028[8].

Technological advances have made countless devices available to patients for self-monitoring, whether for medical, sports or wellness purposes. In consumer electronics, the interest of many users in knowing their activity and health metrics has led to the prolif-eration of activity watches and bracelets, such as Fitbit or the Apple Watch. These and other consumer medical devices are often accompanied by gamified activity programs (based on challenges and social competition). At the same time, advances in genetics have leapt from scientific use to consumer health, making molecular tests and genetic analyses available to the average citizen who, beyond discovering their propensity for certain diseases, can learn about their sensitivity to certain substances and change their habits to meet their health and wellness objectives: sleep better, lose weight, improve their cardiovascular capacity, etc.

These advances provide people with the tools to have more knowledge and control over their wellbeing, empowering them and making them an active part of prevention and the path to better health. At the same time, they allow health operators (both public and private) to build a closer relationship with the most at-risk users, offering them support and personalized offers. However, the apparent massive scope of these trends seems to be far from having a tangible effect on the general state of health of the population, as lifestyle-related diseases (sedentary lifestyles, smoking, diet, etc.) are experiencing uncontrolled growth. Europe alone is home to 61 million people with diabetes, a disease that last year caused more than one million deaths in the region. The number is expected to increase by 10% by 2030, reaching 67 million people[9]. ∎

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[8] Grand View Research: Home Healthcare Market Growth & Trends.

[9] International Diabetes Federation: Diabetes Atlas.

#3 Empowerment
The user has the power. Will they want to use it?

WATCH VIDEO

Miquel A. Bru, Made of Genes

We have seen that curing does not make the system sustainable. The key is prevention.

"If hospitals were full, if we were all in lockdown at home, it was precisely because the system could not provide care to every citizen. Prevention is about changing habits, and genomics enables us to analyze the data that may be key to empowering that person and changing their life."

THOUGHT

Is there still room for gamification?

While gamification is an old acquaintance in wellness solutions, "serious gaming" is making its way into health treatments. EndeavorRx, for example, is the first video game with a medical prescription to treat ADHD. Reflexion Health, meanwhile, launched Vera (Virtual Exercise Rehabilitation Assistant), a home-based musculoskeletal rehabilitation platform that captures the patient's movements and guides them through 3D avatars, two technologies that are typical of video game consoles such as Nintendo Wii or Microsoft Xbox.

#4
Customization

Technologies that bring precision medicine

In the last 10 years, medicine has been one of the fields with the greatest interest and potential for artificial intelligence: massive data processing makes it possible to train algorithms capable of anticipating a disease, finding the right diagnosis, or identifying the treatment with the greatest probability of success. Obviously, these advances have not been immune to the barriers to access to information mentioned above: silos, the immaturity of digital medical records or the amount of data that simply does not exist in any system. Even so, the results are very promising, and some studies claim—not without controversy—that artificial intelligence has already surpassed human beings[10].

Artificial intelligence is essential for personalized medicine (also known as precision medicine). The key lies in combining mass access to aggregated and anonymized information with data sources relating to a specific individual: their medical history, data from DNA sequencing and molecular phenotyping, contextual and behavioral factors captured by devices, etc. In addition, because of artificial intelligence, personalized medicine is not limited to a present diagnosis and the choice of treatment: it also enters the predictive world, helping medical personnel to foresee future ailments and anticipate the impact of a given treatment on the patient.

One of the main enablers of predictive analytics is simulation capability. The use of digital twins is an increasingly widespread practice in health: artificial intelligence uses large amounts of data to virtually represent complex systems and simulate possible scenarios when certain variables change. Health and Industry 4.0 are taking the use of digital twins to the next level, creating large networks of twins to simulate entire ecosystems, supply chains and even the various organs of the human body. In fact, 87% of companies say that digital twins are becoming essential to collaborate within the ecosystem, and 66% expect to increase investment in digital twins over the next three years[11].

Another of the technologies behind the concept of personalized medicine is 3D printing[12]. Investment in 3D printing applications for health is expected to reach €6 billion by 2027. At the preop-

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[10] HospiMedica: AI outperforms Humans in Diagnosis of Skin Lesions.

[11] Accenture Digital Health Technology Vision 2021.

[12] Mobi Health News: Top 8 healthcare uses for 3D printing.

erative level, 3D printing is a very useful tool for testing and planning interventions using 3D replicas of patients, thus reducing operating times and risk factors in the operating room. The possibility of printing prostheses, orthoses, and even medical material also enables overcoming barriers of customization and availability, thus creating a positive impact on the patient and the healthcare system as a whole. ∎

WATCH VIDEO

" **Lluís Montoliu,** Centro Nacional de Biotecnología · CSIC

There are no illnesses, only ill people.

Each of us will react differently because, although we all share a similar number of genes, the variants of these genes, how they interact with each other, how we will face pathogens, and how we will react to drugs—even vaccines—will be different. That's why there are people who take the same drug and get relief or even cure a disease, while for others, that drug seems to be ineffective. That is why we need medicine that considers the genetic aspect, that takes into account our individuality."

THOUGHT

What can we expect from the Metaverse?

Although they may sound like science fiction, digital twins–like the famous Metaverse–are already an everyday reality. When we collect and process real-time data through sensors, we are actually creating a replica of the observed context in the virtual world, allowing us to put AI to work. Biofourmis, for example, is a health platform that enables automatically adjusting treatments based on patient data (collected through wearables and other devices). Similarly, AsthmaMD enables patients to self-monitor and control asthma attacks through adaptive medication delivery.

#5
Home-spitals
Health moves into the home

We have already mentioned the boost that the pandemic has given to telemedicine. By February 2021, the use of remote medical services–which peaked in April 2020, during the mass lockdowns in Europe–was 38 times higher than pre-pandemic levels, confirming eight months of relative stabilization[13]. In other words, it seems that telemedicine is here to stay, so a significant portion of primary care will move from medical centers to homes: it is estimated that in 2025 home care spending will represent 25% of the total health budget[14]. This trend is not new. Back

in 2016, the World Economic Forum coined the term home-spital[15].

The factors driving this movement are diverse but indisputable. First, the saturation of public health systems (even before the pandemic) and the slowness with which physical infrastructures adapt to population growth in urban areas. Second, the aging of the population: in the rich countries of Europe, the percentage of the population over 80 years of age will double between now and 2050[16]. Third, the need for public and private healthcare providers

(including insurers) to alleviate operating costs to accommodate the prices of new treatments. Fourth, and more than anything else, the need to restore to healthcare the human, close and quality treatment that tensions in the system have worsened in recent years.

But decentralization of healthcare is not without its challenges either. First, health providers must ensure proper compliance with treatments, so it is vitally important to establish control solutions that respect patients' privacy. This may lead to new business models

that proactively incentivize good patient practice. Further, we cannot underestimate the logistical challenges inherent to the home delivery of medicines, the provision of medical equipment, or conducting home visits.

Decentralizing the health system does not only mean connecting doctors and patients remotely: this transformation encompasses all aspects of the value chain. Today we find different remote diagnostic formulas, with applications ranging from general medicine–such as the kit with devices from TytoCare–to

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[13] McKinsey & Company – Telehealth: A quarter-trillion-dollar post-COVID-19 reality?

[14] McKinsey & Company – From facility to home: How healthcare could shift by 2025.

[15] World Economic Forum: Healthcare in 2030 - Goodbye hospital, hello home-spital

[16] World Economic Forum: The EU is ageing and in need of care.

#5 Home-spitals
Health moves into the home

sophisticated ailments, such as sleep apnea–see the non-invasive method from Acurable–. In addition, new forms of digital therapy have proven to be able to increase the quality of service and at the same time contribute to alleviating the scarcity of resources. Self-service health solutions, such as PAI Health (cardiovascular health) or Koa Health (mental health) use artificial intelligence to deliver personalized programs that the user executes on their own, at their own pace. The physician, in this case, remains in the background, monitoring the evolution of the indicators and watching for possible warning signs that require intervention. And, finally, there are countless patient monitoring solutions, such as Donisi for pulmonary congestion. ∎

WATCH VIDEO

" Pedro Díaz Yuste, Savia · MAPFRE Digital Health

It is difficult to replace face-to-face care with remote care. But Covid changed everything.

"There were many heroes in the healthcare sector, both those who were in the medical centers every day and every night and those who, even when under lockdown, supported society through the Savia platform. Sixty percent of Savia's users started their first experience with telemedicine during lockdown."

THOUGHT

Will the true value of IoT finally emerge?

Donisi and Acurable are two examples of next-generation medical devices that monitor vital signs and biomarkers in a radically different way than ever before. It seems that the internet of things (which flooded homes with junk no one wanted) is finding its place in the home care arena. Another disruptive example is Aerial, which monitors the well-being of the elderly without the need for them to use a wearable that makes them feel controlled and dependent. It does this by analyzing the distortion of the home's Wi-Fi signal.

The challenge of becoming
superhuman

In the introduction to this document, we reviewed the trends that–in our humble view–will shape the future of healthcare. And we did so based on a reading of the present; that is, on an interpretation of tangible signals, real examples that are available on the market.

We have described the effervescence of the sector, with billions of dollars fueling the race to conquer a growing market. We have identified interoperability as the essential key for unlocking the true potential of data. We have spoken of empowerment; i.e., the ability of the individual to become an active agent in the management of their health and wellbeing. We have discussed personalization, not as a frill but as a real lever for improving diagnostics

and treatment. And, finally, we have mentioned the necessary shift of medical services to the home.

But what comes next? What disruptions are brewing in the laboratories that could completely change the outlook illustrated on the preceding pages? Let's mention our five favorites.

Genetic editing. CRISPR technology–which enables cutting and pasting pieces of genetic material into any cell–can take us from prevention to non-occurrence, eliminating the possibility of developing certain diseases.

Anti-aging. The most recent innovations aim to delay death by rejuvenating the entire human body at the cellu-

lar level. Examples are therapies for the prevention of DNA degradation or the use of stem cells to replace old or damaged cells.

Bionics. Bionic limbs as substitutes for conventional prostheses and prototypes of bionic organs (eyes, lungs) could be a solution to recover lost abilities or even improve them.

Brain-machine interfaces. Companies like Neuralink suggest that we will eventually be able to communicate with machines without the need for sensory interfaces (touch, voice, sight).

Bioprinting. The possibility of printing organs and tissues from stem cells will revolutionize what we understand to-

day as recovery and, undoubtedly, the world of transplants.

It is impossible to either ignore or quantify the technical, legal and (above all) ethical barriers that separate each of these technologies from our present. But the speed at which our reality is changing makes it necessary to keep them in mind and, of course, always keep the conversation open so as not to lose track of the coming health. ■

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