HEALTH MANAGEMENT

THE PARADOX OF HEALTHCARE
SYSTEMS IN THE 21ST CENTURY

“NO” COUNTRY FOR OLD MEN

ROUNDTABLE

Unlike the Coen brothers’ famous movie *No Country for Old Men*, it seems our world is increasingly becoming a place for elderly people, putting additional pressure on healthcare systems.
Learn how Europe, Latin America and Asia are facing these challlenges through the insights of our experts.

The worry about how healthcare models will be funded in the near future spans countries and continents with a growing consciousness that public systems must be supported by private solutions. This inevitably draws attention to what is probably one of the most complex political and social issues.
To find out how their regions are coping with these challenges and how they envision the future, FULLCOVER talks to experts from Europe, Latin America and Asia – Ana Mota, MDS Portugal, Gustavo Quintão, MDS Brazil and Julie Lim, Acclaim Brokers, Singapore.

What is the role of the private and public sector in health protection? What services are provided by the State and the private sector?

Ana Mota (AM): In Europe, Docteur & Oxley[1] and the OECD[2] have identified three main healthcare funding models. They base their classification on a public and private financing criteria and the contractual relationship between healthcare service providers and payers. The models are:

- Public integrated – public financing and public healthcare providers (healthcare professionals are for the most part public sector employees)
- Public contract – combines public financing either through taxation or social security funds with private healthcare providers
- Private insurance/provider – public entities contracting private healthcare providers.

In most countries, public and private hospitals coexist in differing proportions. For instance, in northern Europe there are mostly public hospitals, whereas in the south, private services are growing. The service provision is very similar in both sectors, with some care for cases like pandemics, organ transplant or other exceptions, exclusively provided by the State. Recently the private sector has extended its range of services to areas that used to be exclusive to the public sector. This trend is expected to continue and is a direct consequence of private health insurance development.

Gustavo Quintão (GQ): The south American continent has witnessed continual and many recent transformations - namely social (including healthcare provision), political, economic and cultural. Quality universal healthcare for people is an aspiration all countries share, even though they face similar barriers to implementation: resource management, underfunding and significant demographic shifts.
In Brazil we have the largest State-funded health system in the world, a global example of free, universally-accessed healthcare. The 1988 National Constitution established this single-payer health system - *Sistema Único de Saúde* (SUS) - governed by principles of access for all, equity and the provision of a comprehensive service. It declared 'everyone has a right to health and it is for the State to provide it'. Free enterprise can act through *Saúde Suplementa*r (complementary health), which covers a quarter of the country's population, about 50 million beneficiaries. Relying on private health plans does not prevent you accessing SUS services.

Julie Lim (JL): Like many countries globally, the healthcare systems in Asia are disjointed and constantly plagued by issues such as: overcrowding in public hospitals, long waiting times (as the patient to healthcare worker/doctor ratio is much higher), highly inefficient and complicated systems and differences in geographical coverage where rural areas have access to only very basic medical facilities. As the population becomes more affluent, the imbalance between the ratio of healthcare workers/doctors at public and private hospital will continue to widen. That said, healthcare models in Asia are diverse in structure but are generally categorised as:

- Universal healthcare provided by public and private sectors
- Subsidised public healthcare for citizens
- Private healthcare offering first-class services.

Healthcare funding also varies, typically from three main sources:

- National and local government
- Mandatory contributions from individuals (under social security legislation)
- Insurance (State or privately managed).

In Singapore, for instance, there's an integrated public healthcare system offering timely, cost-effective and seamless services for all residents with a subsidy for citizens and permanent residents. Services include: primary healthcare, hospitals, dental, mid to long term care and traditional Chinese medicine. Private hospitals and clinics mainly support residents and tourists from other countries.
In China, the public sector provides a fee-based service with limits set by local health authorities. Reimbursement is made

> The role of service mediators, such as insurers, operators, brokers and consultancies, is of the utmost importance due the need to reorganise the system to cope with rising costs.
>
> **GUSTAVO QUINTÃO**

via a State-managed insurance scheme with cost sharing and out-of pocket expenditure for both primary and hospital services subject to maximum limits. The public healthcare infrastructure comprises township and community hospitals, plus village doctors and clinics in urban and rural areas.
Private hospitals and clinics exist mainly in urban areas and private health insurance covers deductibles, co-payments and other cost–sharing gaps.
Indonesia has a different system, offering free healthcare supported by private hospitals and semi-private pharmaceutical industries via a national universal insurance scheme that runs alongside private insurance plans.

How do they work together? Do they offer people alternative options and how do they support/complement each other?

AM: In general, citizens may choose one system or the other, so in most countries the system is complementary rather than alternative. There are, however, significant differences in the level of private sector support within each country, and access to this service is dependent upon having the money to buy private insurance.

GQ: Although it is a complementary scheme (when citizens enrol in a health plan, they don't give up their right to public sector services), Brazil's private health cover has increasing support because, when its performance is compared to the public sector, it has better quality, with shorter wait times and a superior infrastructure.
Private healthcare, however, faces barriers of its own. Corporate health plans, which represent about 80% of this market, face difficulties in offering continual medical assistance as a benefit, because due to inflation in the country, the costs just keep growing (by 8-10%). Yet health plans are among the most sought-after employee benefits, which means companies should continue offering them.

JL: Given the size of Asia's population, it's not surprising healthcare's considered the world's fastest-growing market (fueled by the rapidly-ageing population and a growing affluent middle class) and Governments are either already adopting or looking into insurance plans to support a more integrated universal healthcare system. For any national healthcare insurance plan to be sustainable it will require public healthcare systems to have minimum standards for technical facilities and service delivery. This enables them to run alongside private healthcare services and avoids over-reliance on private healthcare facilities. As we know, the respective public and private sectors have very different goals making any alliance between both systems challenging.

If health protection is State provided, is there universal access and is it free? Are there costs involved?

AM: In Europe access tends to be universal, including models with higher co-payments than others. In northern Europe the system is almost totally free, while in southern countries co-payments are made in the public and private sectors (for health insurance).

GQ: Brazil's public system is funded solely and exclusively through general taxation. Payments into the public health system are made at a municipal, State and federal level and private health insurance is paid voluntarily by the policyholder (the insured, a legal representative or professional association).
Chile provides a south-American example that differs from Brazil. Chileans pay 7% of their income towards the healthcare system, and this allows them to choose between public and private services. Public services are provided through Fondo Nacional de Salud, 'National Health Fund' (FONASA) and private services through Instituciones de Salud Previsional, 'Provident Health Institutions' (ISAPREs). The latter replaces, not complements, the government-funded system and once you join the private system, you cannot access public services.

JL: It varies according to countries. In Malaysia for instance, universal healthcare is provided under a system of subsidised public care delivered through a network of primary clinics and hospitals. The government is the primary provider of public health services which are funded by citizen's taxes. In Singapore all citizens and permanent residents are covered by

the National Healthcare Insurance Scheme, which is paid for by their social security fund (and partly co-funded by employers' contributions). China has a different system altogether as most healthcare facilities are provided by the public sector. Public hospitals are thus heavily-funded by the government. There is no free medical treatment except for life-saving accident and emergency. Health insurance is administered by the government with contributions made by both employee and employer. Citizens must pay an excess and contribute towards the cost of treatment.

What is your operating and financial healthcare model (ie hospitals and health centres vs home care and is it financed via tax, co-payments etc)?

AM: Again, models vary according to geography. In northern Europe it's mainly home care financed by the public system while central and southern Europe is more supported by hospitals, medical centres, public and private clinics etc. As to financing, in the north it's funded through tax/social security contributions whilst elsewhere it's a mix between tax, social security, co-payments and private insurance.

GQ: Brazil's public health system imposes no direct costs on users, as it's funded through taxation. Access is free and universal. Private health funding varies by contract. You could be asked to pay a flat monthly fee, or be subject to moderating factors, such as co-payment models or pay-per-use so that each new treatment brings additional costs.

JL: In Asia, healthcare is delivered through properly licensed and recognised medical institutions. Home care is not common as there are various alternative solutions such as nursing homes, hospices, eldercare and chronically sick facilities. The government's philosophy on healthcare financing has always been that people must be partly responsible for their healthcare costs. Hence, healthcare is funded via taxes, salary contributions and co-insurance with excess payments.

GUSTAVO QUINTÃO

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Gustavo has a degree in medicine from the Federal University of Minas Gerais and trained in general surgery and intensive medicine at Cook County Hospital, Chicago, in the United States.
He completed Brazil's Ministry of Education-accredited Occupational Medicine programme,specialising in corporate health, at the Odilon Behrens Hospital in Belo Horizonte and studied for a Master of Business Administration at the University of Navarra's IESE Business School.
Gustavo has inputted to health management consultancy projects for various sector organisations and companies and has leadership experience with multinational companies (he was head of occupational health & safety at Telefonica and medical director at Sanitas International Group).

What is the role and importance of the insurance sector?

AM: Because of the differences in national health and social security systems, the role of private health insurance differs significantly between countries. In Europe it takes four basic forms:

- Additional – complementary and supplementary – voluntary health insurance comprehensively supports the statutory insured[3]
- Substitute – insurance replaces publicly-funded healthcare
- Duplicate – insurance operates as a private alternative in parallel to the public subsystem (as in the UK and Spain)
- Mandatory – private health regimes, such as the Dutch and Swiss health systems, include some public aspects and fully private complementary cover.

> “Europe is a rapidly-ageing continent, so this subject should be a top priority. Population ageing and rising medical costs, coupled with new medical technologies, pose great challenges for insurers and the community in general.
>
> **ANA MOTA**

GQ: The role of service mediators, such as insurers, operators, brokers and consultancies, is of the utmost importance – given their position in the market and their ability to perform holistic analysis and recommend corrective measures that may mitigate the risks companies are exposed to. Because of the need to reorganise the system to cope with rising costs, consultancies are becoming increasingly important.

JL: Insurers can take on a bigger role in this area; they should study and analyse what State healthcare services and funding are already available and develop insurance products to bridge the gaps in health cover. This eliminates wastage of government funding on national healthcare schemes, employers' spending on corporate health insurance and consumers unnecessarily paying for healthcare services.

Is health insurance based on a managed care system or is it still a reimbursement system? Do insurers have their own health units?

AM: In most countries there's a managed care or mixed system. In some countries, such as Spain, insurers have their own health units and Portugal also tends to do this.

GQ: Brazil's private health plans currently adopt various models. They all provide an assistance network (meeting national standards, privately owned, or a mix of the two) and most offer repayment options if you want to use providers outside the network available to you. As reimbursement generally covers all, or almost all expenses, these plans are more attractive, however they're often only available through high--tier policies. Lower-tier plans make smaller reimbursements and users must pay out of pocket for the remainder.

JL: Health insurance is still largely managed in two ways: through managed care and reimbursement systems. The managed care model is mainly used where low-cost insurance premiums are offered and medical care is closely monitored. The reimbursement system is commonly offered in employer-paid insurance programmes as it allows employees to seek treatments with their preferred medical professionals. Private insurers do not typically own health units or medical facilities. There are well established medical providers and hospital groups in the region offering world-class facilities and services. For example, Fullerton Healthcare headquartered in Singapore operates in four markets in Southeast Asia and Australia. The company offers primary care and has hospitals and clinics charging medical fees lower than general hospitals. KPJ Healthcare, a major healthcare facilities provider in Malaysia, treats patients with insurance in a 'stable' condition. Managing health units is not a core business activity for private insurers. They would rather partner with medical providers and offer consumers first-class services at controlled costs.

Looking to the future - how are countries facing the ageing issue and tackling the healthcare costs associated with long-term care provision?

AM: Europe is a rapidly-ageing continent, so this subject should be a top priority. Population ageing and rising medical costs, coupled with new medical technologies, pose great challenges for insurers and

the community in general. This will most likely result in even more growth in private insurance sector solutions – particularly for long-term care - but these will only be sustainable if there's some public sector contribution. So far there have been no significant developments in this area in most countries. In order to find a sustainable and efficient solution, there must be a political discussion involving all stakeholders. The few existing solutions are isolated and mostly insufficient.

GQ: If you take technological and medical advancements into account, we're looking at an era of increased life expectancies. So this brings an important concern to the fore: how do we care for people so they age in a healthy manner? Highly complex treatments have a profound effect on health budgets, so if individuals maintain a healthy lifestyle, it will considerably lessen the impact. With this in mind, primary care strategies focusing on advocacy and prevention are gaining more traction. Family medicine, for example, which lost ground to specialist doctors, is now considered a model that could help turn things around. The main barrier to implementation is, above all, cultural. We have a population that would prefer to see a specialist because they believe specialists provide better service. That's not necessarily true - studies show a family practitioner can resolve more than 80% of cases and, when they need to refer you to a specialist, they do it in an informed manner, considering patients' real needs.

JL: With a population of 4.5 billion and growing (as of December 2018), Asia is the largest and most populous region in the world. Its population almost quadrupled during the 20th century and Deloitte estimates that over 60% of the total global population aged 65 years or older will reside in Asia by 2030. This, coupled with rising affluence creating a wealthy and expanding middle class, is causing an imbalance in the public and private healthcare eco-systems. In fact, Asia's affluent consumers are set to increase this century and they will expect more from their healthcare services. Rising affluence also creates rising healthcare issues; habit changes such as sedentary lifestyles and diet choices contribute to modern day diseases thereby raising healthcare costs. Another effect of consumers' affluence is the over-consumption of insurance. Health insurance products that offer very 'rich' or comprehensive benefits are popular with the affluent, creating an adverse behavioural effect. With generous insurance benefits,

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consumers tend to use more healthcare services such as undergoing unnecessary medical tests and failing to set a realistic budget for their medical costs. These costs ultimately increase insurance premiums in the long term.

What solutions are you putting in place and what impact do you think this will have on the insurance sector?

AM: There are currently no appropriate solutions in place, but the insurance sector has an important role to play in finding an answer, together with governments and other stakeholders. Demographic policies might have some relevant contributions to make, but in several European countries (Portugal included) the fertility rates are not much higher than one child per women, giving us the prospect of a very bleak future in this area.

GQ: A good example of technology to support healthcare is the growing implementation of the *Prontuário Eletrônico do Paciente* 'Electronic Medical Record' (PEP). This system logs patients' medical data and shares it with other platforms, raising the quality of assistance as it logs all the care a patient receives. Another technology now gaining ground is remote assistance. Its advantages include: reliability and the provision of a fast service, while once again, improving the quality of health services for those in need. All these solutions, when used, greatly reduce waste.

JL: Looking ahead, the healthcare landscape is largely about partnerships, engagement and innovation. All stakeholders in the healthcare system, including the government, will need to collaborate further to reduce wastage and the financial burden - in areas from formulating policies to product development. Advancements in healthcare and digital technology will bridge the communication gap between all those involved in the healthcare system, accelerating the transmission and accessibility of data for analytics and product innovation.

How will new technologies impact health insurance, particularly from a cost perspective?

AM: We can see this from two different perspectives: on the one hand, new technologies for treatment or surgical and diagnosis procedures are inevitably increasing costs in the short term; but

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At MDS, Ana coordinates and manages the life, pensions, health and accident (personal accident and workers' compensation) areas.

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>
> **JULIE LIM**

new technologies that allow for early diagnosis, help prevent future costs that would inevitably occur, due to complicated surgical procedures and costly treatments. Also, telemedicine provides quicker and less costly access to healthcare, for instance preventing patients from using emergency units in around 60% of cases, and in a higher percentage, replacing that second medical appointment. Here, as patients auto-monitor themselves and so are likely to take more preventative measures, technology will contribute to reduce costs in the medium--long term.

GQ: In the private sector, technological tools are enabling us to anticipate future risks, helping to reduce costs and optimise resources. At present, machine learning algorithms can, with high certainty, predict groups of individuals with a high likelihood of developing a given pathology. This type of solution stops us looking at medicine in our rear-view mirrors; we can now look forward and work smartly and efficiently to try to solve or reduce health issues.

JL: The healthcare industry is not spared in this age of digital revolution and digital health innovations will certainly play a significant role. Using data to deliver healthcare efficiently and effectively improves treatment outcomes, prevents health insurers running unnecessary tests and treatments and so minimises costs in the long run. In addition, consumer-friendly mobile apps will get people involved in taking charge of their health. Mobile apps offer a myriad of opportunities, early health intervention and healthcare solutions for consumers and medical providers.

What role have insurers played in health education and how important do you feel this is?

AM: For some time now insurers have understood that being proactive in prevention is very cost effective (rather than paying for treatments after a declared and more advanced disease). Today, for example, health insurance policies cover total or partial regular client check-ups. In our opinion insurers should take a more active role in health education, particularly in promoting healthy habits.

GQ: According to Stanford University, a person’s health is determined mainly by their lifestyle (53%), their environment (20%), genetics (17%) and finally, health services (10%). Technology may bring countless opportunities to improve health systems and service delivery, but people and their choices can make the greatest change. Although health providers are important when it comes to offering tools and resources for people to look after their health, without ownership and engagement from each individual, barriers cannot be overcome. In this context, education - from beginning to end of the health service chain – plays a key role.

JL: Insurers do not play an active role in public health education as no budget is set aside to run country or state-wide campaigns. Public health education is actively promoted by the Ministry of Health in each respective country. In the private sector, insurers partner with independent healthcare providers or sponsor campaigns to run targeted marketing initiatives. These often follow the government’s recommendation for a health programme or are due to the implementation of specific laws or policies. Collaboration with the government and all stakeholders in the healthcare eco-system is crucial to the sustainability of healthcare costs and it is therefore paramount all parties work together to achieve common goals. •

1. DOCTEUR, Elizabeth, OXLEY, Howard - Health--Care Systems: lessons from the reform experience. *OECD Health Working Papers* [online]. N. 374 (December 10, 2003). Available at: https://ssrn.com/abstract=1329305

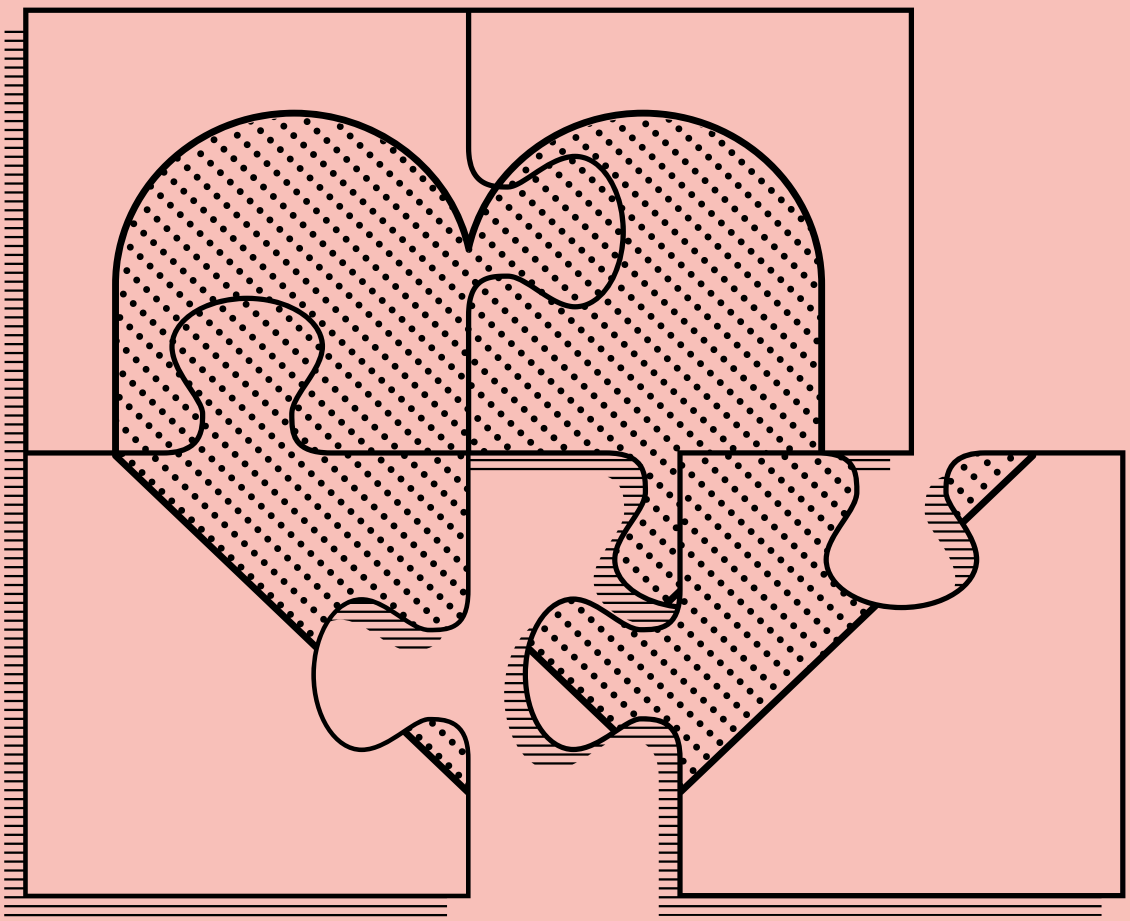
2. OECD - *Private Health Insurance in OECD Countries*. Paris: OECD, 2004. ISBN 9789264007451

3. INSURANCE EUROPE - European Insurance in Figures - 2016 data. Brussels: Insurance Europe, 2018.

HEALTHCARE AND THE AGEING POPULATION

The past decades have witnessed a significant improvement in living standards across many areas that influence our well being. Such progress is mainly due to economic and social development and the creation of social security and healthcare systems in a number of countries.

BY **ADALBERTO CAMPOS FERNANDES**, NOVA UNIVERSITY



A modern, fair society must, through universally-accessed systems offering general cover, guarantee the right to health in an equitable manner. In a democracy, barriers that prevent citizens accessing timely and appropriate healthcare cannot be tolerated.

Success, for any health system, is dependent upon innovation and technology evolving from knowledge--generating scientific research. Indeed astounding breakthroughs have been made, namely in genetics, because of the work in highly--sophisticated technology-driven fields such as nanotechnology and pharmacogenomics.

The technological revolution has thoroughly transformed global health systems and we see a growing powerful correlation between innovation and development. At the same time, there's also a profound change in disease distribution and demographic patterns.

The paradigm of chronic disease has progressively replaced that of acute illness. Some of the more communicable diseases, such as HIV-AIDS, have gone through significant changes in their epidemiological profile, turning them into controllable chronic diseases, and there are breakthroughs in the prognoses for other communicable diseases with high morbidity and mortality, such as Hepatitis C.

Over the past few years, developed countries have witnessed demographic changes, slowly moving to an aged population with a growing number of dependent citizens. Health systems must now consider factors outside their organisational structure and response models. The costs associated with therapeutic and technological innovation, for example, challenge the sustainability of health systems, making it increasingly difficult to define health policy priorities.

Demographic changes (populations ageing at a notable pace) will have significant social and economic consequences. In 2020, the number of people over 60 will exceed children aged under five, and between 2015 and 2050, the worldwide percentage of people over 60 will almost double, from 12% to 22%.

Since the early nineties in Portugal, people aged over 65 grew to 35% and the number of young people and children under 25 dropped by more than 20%. In 2060 Portugal, the resident population will go from its current 10 million to 8.6 million and the proportion of senior citizens to young people, now at 131/100, will rise to 307/100. During the next 50 years, it's predicted the number of people over 65 will double, with inevitable consequences for healthcare and social security systems.

The world has changed over the past four decades; society has transformed. Health needs have become more complex and there's fiercer competition for resources. The sustainability of health systems is more and more dependent on how national economies perform and, as a consequence, what services can be offered.

It's therefore essential to debate mid to long-term funding and sustainability for national health services (SNS in Portugal). This presents us with a complex challenge: how do we guarantee sustainable and long-term funding for public health systems, ensure they deliver and continue to change with the times, reward and value their staff and enable access to technological innovation?

Health policies concern all of us and impact generations over time. This new dilemma pits ethical and human needs against budgetary limitations. In the main, we have to raise awareness with all stakeholders that if resource--sharing is the single goal, the choices made must be carefully prioritised. As we move to integrated care in this way, we need to 'think globally, act locally' and put our citizens at the heart of the system.

A sustainable future requires considerable infrastructure, equipment and human resources' planning taking into consideration demographic changes, the burdens of chronic illness, access to therapeutic and technological innovation, public health actions and the indispensable participation of people. •

ADALBERTO CAMPOS FERNANDES

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THE LONGEVITY CHALLENGE

Longevity is one of the first words that spring to mind when discussing healthcare systems' challenges. This is primarily due to our ageing population. If I had been born in the 1940s, I would by now, have entered the final stages of my life. But, thanks to a combination of social and scientific advancements, Brazilian life expectancy has grown by a 30-year span over the past seven decades and today it's edging close to 76 years, according to the Brazilian Institute for Geography and Statistics (IBGE).

BY **MARIO SADDY**, AMIL

Although this is an average, the generation that will live over 100 years has already been born. The United Nations estimates that in 2100, there will be 21 million people aged 100+ worldwide and in Brazil there will be 110 times more citizens over this age than it does now, totalling more than 1.5 million people.

In the 1930s, infectious diseases were the main cause of death throughout Brazil. Since then, the country's epidemiological profile has changed. The leading causes of death in Brazil now are noncommunicable diseases, especially cardiovascular conditions, several types of cancer, diabetes, respiratory diseases and diseases of the digestive tract. Given this new scenario, advancement in new technology/ medicine and investment in urban infrastructure/communication will be essential to help people reach old age in better health (particularly as we're in an increasingly interconnected world and false information is easily spread).

Though longevity doubtless comes from progress, an ageing population brings significant challenges, particularly when it comes to how we maintain their quality of life. This is where healthcare system sustainability is crucial. Our current health cover model - where technology is adopted without cost-effectiveness analysis and there are not-so-favourable clinical results - indicates a clear market misspend. It's time for a paradigm shift to the more-favoured assistance model. It took decades for the Brazilian market to incorporate a treatment--centred model and another few years again to realize this is not an ideal way to care for people's health.

One day we'll remember how in the past people submitted to dozens of tests and saw dozens of specialists in an uncoordinated fashion, which made no sense. While we wait for that day to come, some players in the Brazilian insurance-based supplementary healthcare system have taken the lead and brought traditional primary care into their private health offering. Discussed in 1978 at the International WHO Conference on primary healthcare, the Alma-Ata declaration identified primary healthcare as key to achieving good health for all. Although not new, in Brazil

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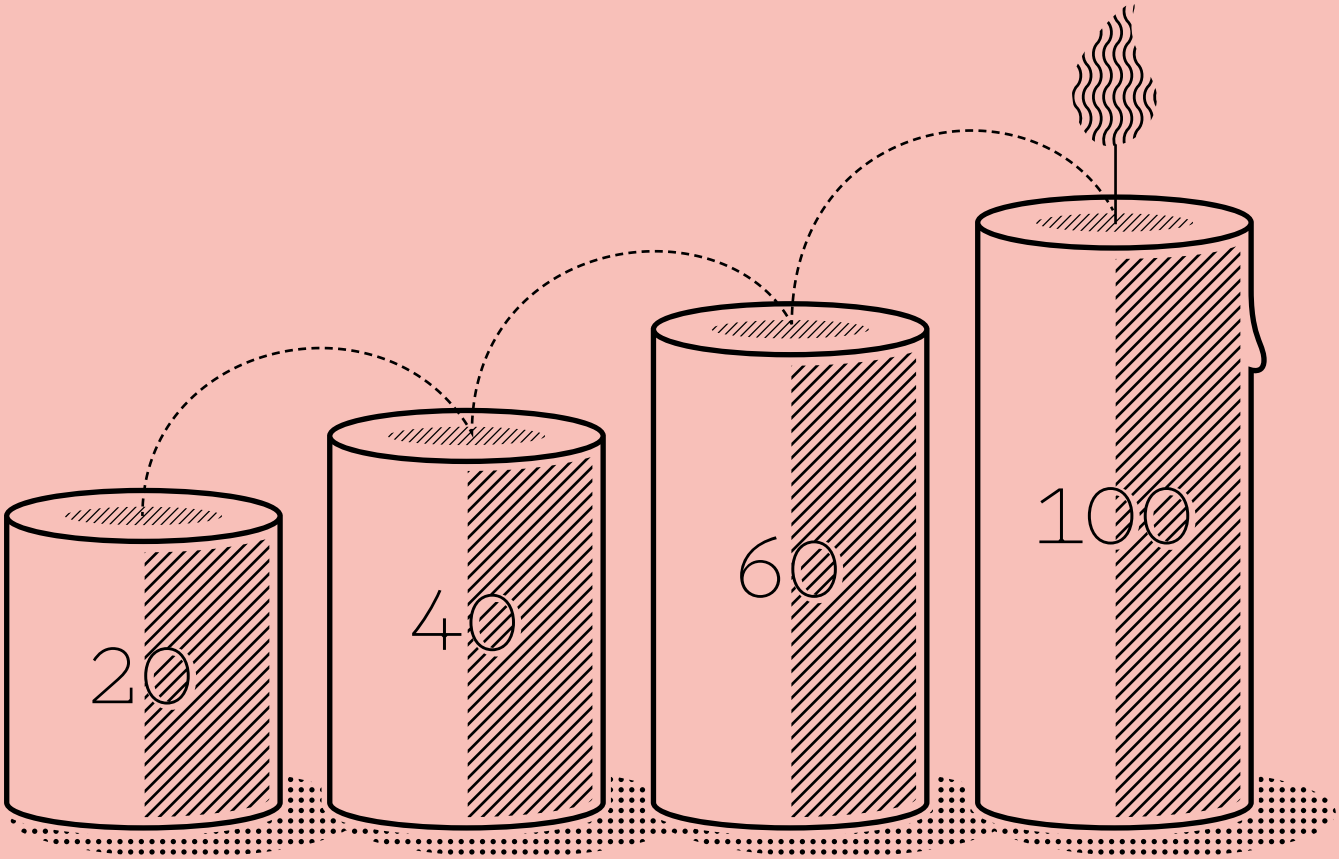


such essential or primary healthcare, particularly in the private sector, has not been widely available. While 67% of Brazilians can access public family health programmes, only 25% are able to do the same within the private health sector.

It's widely agreed further investment in coordinated healthcare is necessary to keep the sector sustainable. However, for a less fragmented approach to succeed, greater engagement with patients is essential; starting by ensuring they understand their responsibilities and their family doctor relationships. Patients also need to appreciate the importance of regular health monitoring and change frequent habits, such as unnecessary trips to the emergency unit. According to Ministry of Health data, about 80% of cases seen by family doctors in medical practices are resolved without referral to other clinical specialists.

Alongside restructuring assistance models to maintain a sustainable market, other areas must be included within the equation, namely: over expenditure, system funding, operational efficiency, transparency and hospital remuneration schemes. Nowadays, most health plan related expenditure comes from beneficiaries' hospital admissions. IESS projections indicate that, by 2030, payouts for this will have reached R$ 260.3 billion, as much as 65% of sector expenditure, funded by consumers themselves.

Currently, hospitals are paid for the services they provide on a fee-for--service basis. In practice, the more CAT-scans, MRIs, X-rays and overnight stays, the more a hospital can charge and the more a health plan must pay. Yet the fee-for-service model, which has been in place for decades, has run its course, and is a key contributor to overspending. According to the IESS, Brazilian health plans have spent R$ 28 billion on unnecessary doctor visits and tests.

There's a growing recognition that payment models for supplementary care in Brazil need to focus more on delivering value. And things are changing. One of Brazil's main hospitals, the Sírio-Libanês, recently signed a contract with Amil (one of the country's largest health operators, with 6.1 million customers), to adopt a fixed monthly remuneration model, based upon the patients' usage history and complexity of services provided. Ten clinical indicators - from the number of complications during hospital admissions and average duration, to general customer satisfaction indicators collected via surveys – determine the value of the care. In order to implement alternative models, there's a need to invest in developing indicators and integrating IT systems (not to mention long periods of negotiation). It's no easy task, but Brazil cannot ignore this trend. Countries like Sweden, the United States and Germany have already adopted this model.

Longevity poses numerous challenges for healthcare systems, none of them trivial. We already know we will live longer. The question is whether we will live with or without health plans. The answer lies with those involved in this demanding supplementary care sector – agencies, hospitals, customers, doctors and all other player – and how innovative and proactive they can be. •

2018 WORLD'S MOST
INFLUENTIAL PATHOLOGIST

CUTTING EDGE RESEARCH

Fátima Carneiro, named the world's most influential pathologist in 2018, talked to FULLCOVER about a lifetime of challenges and achievements, clearly showing a passion for work that has not diminished over the years.

Professor Fátima Carneiro was named the world's most influential pathologist in 2018 by The Pathologist magazine. Born and raised in Angola, then a Portuguese colony, she was studying medicine at university when civil war broke out and like many other citizens, she and her family were forced to leave the country. She came to Porto to finish her studies and although she dreamt of being a pediatrician, she ended up as a pathologist - a decision she has never regretted.
Professor Carneiro never chooses the easiest way; even today when she has to look at a patient's tissue on a glass slide, she will, just for the sake of a challenge, do it before getting additional clinical information.
She is a strong believer that no one knows everything and is passionate about the importance of getting a second opinion, which she does in her role.
Extremely demanding and a perfectionist, but never more with others than herself, Professor Carneiro wanted to have it all – clinical activity, teaching and research – and she achieved this with a career in pathology (even though it's been difficult to balance her professional and personal life and she's lost many hours' sleep).
During her long-standing and brilliant career, she has always strived to share her knowledge and FULLCOVER is privileged to have spent time with her.

What drove you to a career in medicine?
My dream was to become a pediatrician as I loved children and the clinical activity. I decided to become a pathologist after I graduated in medicine. It was 1978 and I'd just finished medical school (at Porto University). Manuel Miranda Magalhães, professor of cell biology whom I'd met at the University of Luanda, invited me, at the end of the academic year, to join his team. It was an unexpected invitation and, after some hesitation, I told him cell biology was too quiet a field for my expectations.
It was then his turn to be taken by surprise (as such an invitation should have been considered a compliment), and he asked about my expectations. These were clear in my mind: to be clinically active, to participate in teaching (I loved to do this while still a medical student in my third year) and to have the opportunity to undertake research (quite ambitious, I have to admit). He then just said: "That is pathology." I'd never thought about this (my experience in this area had not been particularly good, it was at the time of civil war that forced me to move from the School of Medicine, Luanda, Angola, to the University of Porto). All of a sudden, this field sounded attractive and, refusing his offer to introduce me to the pathology department director, I decided to go and see him on my own. There I was, in front of Professors Daniel Serrão and Manuel Sobrinho Simões. The latter, well-known for his affability and with some curiosity (I guess), advised I could start work with him the next day. This was the first day of a lifelong experience that I have never regretted. Pathology has allowed me to cover all the areas I was interested in – clinical multidisciplinary work, teaching and research - and it is also clinical activity at a crucial moment – that of diagnosis. Because I don´t have a queue of patients lined up waiting, it gives me some freedom to work in all the areas I enjoy, without time restrictions.

You were named by "The Pathologist" magazine as the 'world's most influential pathologist' in 2018. What research work/ activities led to you being given this prestigious title?
Besides my major involvement in pre and post-graduate teaching (nationally and abroad) and diagnostic activity in histopathology and molecular pathology, I think my work with international organisations played a role. This includes many years supporting international institutions such as the European Society of Pathology (I progressed from member of the Executive Committee, to president, chair of the Working Groups and chair of the Advisory Board) and the World Health Organization (WHO), writing and co-editing editions of its 'blue book' on digestive diseases.

You've contributed to multiple discoveries in the field of gastric cancer; what are these latest discoveries and how did you achieve them?
I would select my contribution in the field of hereditary cancer(s) affecting the stomach. It was fascinating to be involved with the International Gastric Cancer Linkage Consortium and study and characterize the pathological features of Hereditary Diffuse Gastric Cancer (HDGC). More recently, I completed similar work to characterise the histological profile of the GAPPS (Gastric Adenocarcinoma and Proximal Polyposis of the Stomach) syndrome. Countless hours of work were needed to study the whole length of gastric mucosa in stomachs - removed from carriers of germline mutations of the *CDH1* gene (in HDGC) - and hundreds of digital images of GAPPS. The help of Dr Xiaogang Wen, a Chinese pathologist who has been working with us for several years now, was invaluable in these projects.

Sobrinho Simões (Medical Faculty of Porto), Fátima Carneiro, José Neves (MD), Paula Rios (MDS)

Are you using any new research and treatment methods, what are they and will they evolve in the future?
As I am an anatomic surgical pathologist, I do not clinically practice in the sense of observing and treating patients. Currently, my research focuses on characterising the immunological environment of gastric cancer, aiming to better identify patients with gastric cancer who may benefit from immunotherapy. This type of treatment aims at stimulating the patient's immune cells, enabling them to kill, or at least help to kill, the neoplasic (tumour) cells.

> “Currently, my research focuses on characterising the immunological environment of gastric cancer, aiming to better identify patients with gastric cancer who may benefit from immunotherapy.
>
> **FÁTIMA CARNEIRO**

What's the rationale behind personalised medicine and what impact is this having in the prevention, diagnosis and treatment of cancer? Is there a new paradigm within this area?
In its broadest context, since clinicians have been working to provide care tailored to people's individual health needs, all types of therapy are personalised. Within our area, personalised medicine is a move away from a 'one size fits all' approach to the treatment and care of patients with a particular condition, using new strategies to better manage patients' health (prevention, early diagnosis) and to achieve the best outcomes in the treatment of patients (precision therapy targeted to molecular biomarkers).

Are pathologists progressing in understanding the cause and effect of cancer and other life-threatening diseases? Are we nearing the breakthrough stage for cancer?
There is a better understanding of cancer development and a deeper knowledge about predisposing factors that increase the risk of developing diseases, more specifically, cancer. It is now clear cancer is much more than a disease caused by alterations of the genome (mutations in the broad sense). Regulation of the gene expression, by epigenetic mechanisms, is increasingly important. Furthermore, the tumour's environment is a key factor, mediated by inflammatory and immune cells, as well as the external environment, such as lifestyles, obesity and diet.

Is technology changing the delivery model of medicine? Is virtual medicine being increasingly used to provide patients with a more personalised approach and bespoke treatment?
The so called 'virtual medicine' will increase, hopefully supporting a more personalised approach and a move towards individual clinical treatment (while we continue to show compassion for every patient). The role of biobanks, with clinical annotations, is crucial to analyse genetic and molecular features of the patients and their tumours and to correlate with patient outcomes, enabling us to study the outliers (specifically positive, rather than negative ones).

How would you like to see medical services delivered in the future?
Instead of focusing on treating advanced diseases, we should focus more on promoting healthy living, prevention and early diagnosis.

What do you feel are the great advances in medicine over the last decade?
Understanding the influence of lifestyles in the development of diseases and improvement of general health education, getting people more involved in prevention and early diagnoses. Greater use of high--throughput "omics" technology (genomics, transcriptomic, proteomics, metabolomics, etc), that may be applied to the individuals, their tumours and the microbioma, for the better understanding of biological processes and diseases. One of the challenges now is how we deal with 'big data' generated by "omics" methodologies and to make sense out of it.

> “The healthcare industry is not spared in this age of digital revolution and digital health innovations will certainly play a significant role. Using data to deliver healthcare efficiently and effectively improves treatment outcomes, prevents health insurers running unnecessary tests and treatments and so minimises costs in the long run. In addition, consumer-friendly mobile apps will get people involved in taking charge of their health.
>
> **FÁTIMA CARNEIRO**

You're involved in many societies and committees in Portugal and across Europe, how does this greater collaborative approach benefit participant countries?
All the countries have access to shared knowledge through our meetings, benefiting over the years, hundreds of students, residents and pathologists. Publications (scientific articles and books) are also distributed worldwide.

What are your greatest accomplishments and biggest challenges?
There are more than a few, but I'm proud of my seniority in my main field of interest – gastric cancer. This has resulted in many collaborations with several scientific societies, (co)authorship of around 200 papers on gastric cancer (and over 350 peer--reviewed publications on h factor-64) and authorship of chapters in renowned books by the WHO and the Union for International Cancer Control (UICC)[1]. I'm also very proud of my international networking activities. My professional (in the strictest sense) teaching and research initiatives have lead to collaborations on four continents: North and South America, North and Sub-Saharan Africa, Asia (China, Japan and Singapore), Australia and New Zealand, and Europe (the latter mainly related to work with the European Society of Pathology).
As for challenges, the pathologist of the future must be able to understand the mechanisms of disease and to translate new knowledge to patient care.

What advice would you give to anyone considering a career in pathology?
Pathology offers opportunities for research, clinical work, and teaching – so for those who want all three, there's no need to compromise. Pathology is an amazing discipline, and one that plays a pivotal role in clinical medicine and in all of our efforts to better understand disease. It's a profession and integrative discipline and now is an excellent time to join this field.
As a university professor, I believe there are many talented young people joining the profession, but they have a very different mindset. They want to accommodate all the different facets of their life: personal, professional and social – something my generation was not very good at doing. This will mean a clearer definition of their contract roles, as exists in other countries like the Netherlands.

Fátima Carneiro's team @ Anatomic Pathology, São João Hospital

Do you have any hobbies/interests?
I do not currently have much free time, so I spend it with my family and travelling (bringing my children whenever possible). We have spent great times in Africa, Brazil, US, China and Japan, and many places in Europe (from southern to central and northern). I`m now a devoted grandmother to a baby boy and we are soon to have another addition to the family. I strongly suspect my son and daughter agreed between themselves to have children at the same time, but I'm thrilled at the prospect of having two babies in the family. •

FÁTIMA CARNEIRO

Fátima Carneiro has a medical degree from Porto's Faculty of Medicine and a doctoral degree from the University of Porto. She is a professor of anatomic pathology at the Medical Faculty of Porto, head of anatomic pathology at São João Hospital and senior investigator at the Institute of Molecular Pathology and Immunology at the University of Porto (IPATIMUP). She was president of the European Society of Pathology, she is coordinator of the Portuguese Network of Tumour Banks and council member of the International Gastric Cancer Linkage Consortium (IGCLC) and the International Gastric Cancer Association (IGGA).
She is renowned for her contributions to gastrointestinal pathology, including research on the molecular pathology of sporadic gastric cancer and hereditary gastric cancer syndromes.

1. IARC ("Pathology & Genetics of Tumours of the Digestive Tract", 2000; "WHO Classification of Tumours of the Digestive System", 2010; World Cancer Report 2014; "WHO Classification of Digestive System Tumours", 2019 - in press)" and UICC (Handbook on "Comprehensive Tumour Terminology", 2001).

Marc Subirats & Carlos Nueno @ Advance Medical Head Office in Barcelona

TELEMEDICINE AT A TIPPING POINT

Advance Medical is part of the Teladoc Health group, the global leader in the provision of telemedicine and expert medical opinions. Through its virtual health care services, it connects patients to doctors best-suited to help them; making the right diagnoses, developing the right treatment plans and identifying the best facilities for patients to receive care.

Inspirational business plan

Advance Medical was founded in 1999 by Marc Subirats and Carlos Nueno. They came up with the idea while completing an MBA programme at IESE, Barcelona. The pair put together a business plan for an entrepreneurship class which was then selected as one of the best business plans. A year later Marc and Carlos left their jobs and set up the company from scratch.

In 2018 Advance Medical was bought by the American telehealth giant Teladoc, that intended to grow its global market outside the US – into Europe, Latin America and Asia Pacific – and deliver a virtual care service in 20 or so languages. Today the company is a global virtual care leader with offices in eight countries and over 500 doctors providing services in 125 countries.

Using technology to access medical services

It's widely acknowledged there's a long-standing problem with our current health insurance models – whether private, public or mixed systems – all critically impacting each country's economy. Costs as well as demand are rising and there's a shortage of doctors. Often in a normal consultation, most time is spent gathering the patient's clinical history, reviewing and updating information, listening, interacting and assessing the best treatment options. Technology can make consultations easier and faster. Telemedicine is already being implemented in some countries as a way to save costs, reducing hospital waiting room numbers and enabling doctors to spend more quality time with their patients.

Telemedicine is also starting to play an important role in making it easier for patients in remote locations, with disabilities and/or mobility difficulties, even the ageing population, to access medical care. Marc opines: "Imagine if you're living in a remote area without access to doctors. With telemedicine you can talk to a doctor 24/7 from the comfort of your home or when abroad on business. You can ask a doctor any health question – from minor issues or injuries to critical cases – and secure the opinion of a global expert that speaks your language, understands

your background/culture and can relate to your situation."
The industry is at a tipping point and technology is helping create new ways to deliver healthcare services. Advance Medical is investing heavily in technology to build scalable platforms that can support high volumes of patients using their telephone/mobile app platforms and health portals. It's also investing in recruiting the best medical teams & clinical expertise.
"In the end, on top of having a nice app with nice technology, what's important is the doctor you're talking to has the right medical training and experience follows the right protocols and can access the right information in order to answer your question correctly."

Supporting public healthcare
Telemedicine can equally contribute to the efficiency of the public health system, as an average of 60% of patients who use telemedicine will not need to go to emergencies. Due to the increasing amount of work and volume of patients, doctors tend to have less time to spend with patients.
Marc continues: "In Europe today, a public health doctor may need to visit six or seven patients in one hour. Telemedicine can help triage, assist patients, and make improvements in the area of emergencies.
The company has also been licensing its technology and telemedicine services for wider public use in some countries and developing specific projects such as a recent one in Spain which was successfully used with oncology patients.
However there are still sceptics who say telemedicine cannot replace that face-to-face experience. Marc replies: "We agree, but people need to understand telemedicine is not replacing, it's complementing and helping to improve the healthcare system. It exists because patients and doctors like it. Our doctors love telemedicine - they see it is a much better and easier way to help patients for some cases."

Clients
In the beginning, Carlos states: "The biggest challenge was to find the right model for what we were doing. You can have great technology and medical support, but you need to find a way to finance the model so patients can benefit from it." Marc and Carlos developed a model that was accepted and covered by employers and health insurers: "The patients we're talking to are not paying for the service - it's covered by health insurers or employers."
Advance Medical and Teladoc work mostly with insurers and big employers. In the last years, there has been a big increase in multinational clients - companies looking to looking to cover the health needs of its international employees. "Companies must ensure employees are secure when travelling and/or working in foreign countries and give them access to the right medical services, " says Carlos. "This is something that will continue to grow in the future."

Connecting virtual doctors with patients
Carlos continues: "Our database comprises over 50,000 experts with more than 450 specialities, allowing us to identify and review the best care whenever we have critical cases. Last year, more than two million people downloaded our mobile apps to do video consultations or telemedicine through their mobile telephone. This is 24/7 global virtual care."
Marc and Carlos are clearly passionate about their lives' work and Advance Medical's mission to help patients make better decisions, and are adamant the company can meet its goals through a combination of technology and an outstanding team of healthcare professionals working together to provide the best service and care for their patients.

The future
Advance Medical believes telehealth will increasingly grow in the future and as the industry continues to expand, new technology tools and solutions are being developed and in some situations, artificial intelligence is already helping doctors to screen cases. Marc concludes: "Artificial Intelligence gives us access to in-depth data and information, ensuring patients and doctors have the best insight they can. When this sophisticated technology is given to talented, engaging physicians, it can only deliver further benefits and when accessed by patients, it will change their healthcare experience." •

A SUCCESS CASE

A patient, a 37 year old female and mother of 2 kids, who lives in Dubai, went to the doctor after having recurring pain in her right eye. Her ophthalmologist found a retinal mass with localized retinal detachment in the left eye. After further tests performed by the treating team in Dubai, Laura was diagnosed with Choroidal Melanoma. This is a rare type of cancer with a high risk of loosing the eye.

Advance Medical assigned one of their Physician Case Managers to help Laura to gather all the relevant medical files. In one day, a comprehensive clinical summary of the case (including images and scans) was sent to two leading international doctors in ocular oncology, one based in Boston (United States), Professor at Harvard Medical School, and the other based in Oxford (England), Consultant Ophthalmic Surgeon at the Oxford Eye Clinic.

Both experts confirmed the diagnosis of Choroidal Melanoma and identified 2 medical teams in Boston and Liverpool that where currently conducting successful treatments for this very rare type of cancer combining Surgery and Proton Beam Radiotherapy.

ADVANCE MEDICAL

Unrivalled services

- Expert medical opinion
- Expert behavioural Care
- Wider virtual medical support
- On demand global care
- Specialty pharmaceutical management
- Enterprise solutions

Key facts

- **350+** clients
- **900** employees (including **350+** general practitioners)
- **35,000,000** covered lives
- **50,000** experts
- **125** countries and more than **20** languages in-house
- **8** global offices

ARTIFICIAL INTELLIGENCE: THE NEW PREVENTION TOOL

As technology continues to develop at an increasing pace, it's becoming an invaluable tool for those working within and accessing healthcare – professionals, companies and patients.

BY **GUILHERME SALGADO**,
3778 HEALTHCARE

Everyone's talking about Artificial intelligence (AI), yet globally it's looked upon with a mix of wonder and dread. In order to prepare for AI and use it in the best possible way, we need to adopt some critical thinking.

The theory behind AI began in the 1940s, meaning we're discussing a technology that has evolved over the past 70 years. AI is defined as 'a computational model that simulates an intellectual task'.
In general, AI is an excellent tool to categorise and perform predictive tasks. In academic terms, AI is a subdomain of computer science and like so many other areas of knowledge, it has many disciplines. One of the most prominent is machine learning.

AI applications are successfully used in a number of human endeavours, from games and simulations to credit analysis. Nobody can now doubt its relevance. Since the advent of AI, much has been discussed about the future of work, professions, customs and even humanity itself, and this technology has prompted a spread of negative rather than positive ideas.

I'd rather liken AI to being a 'glass half full'.
For example, within the healthcare sector, we know that 40% of a professional's time is spent on bureaucratic tasks. In the meantime, patients are waiting in need of care. AI gives us more time to deal with what matters most: human beings in need.

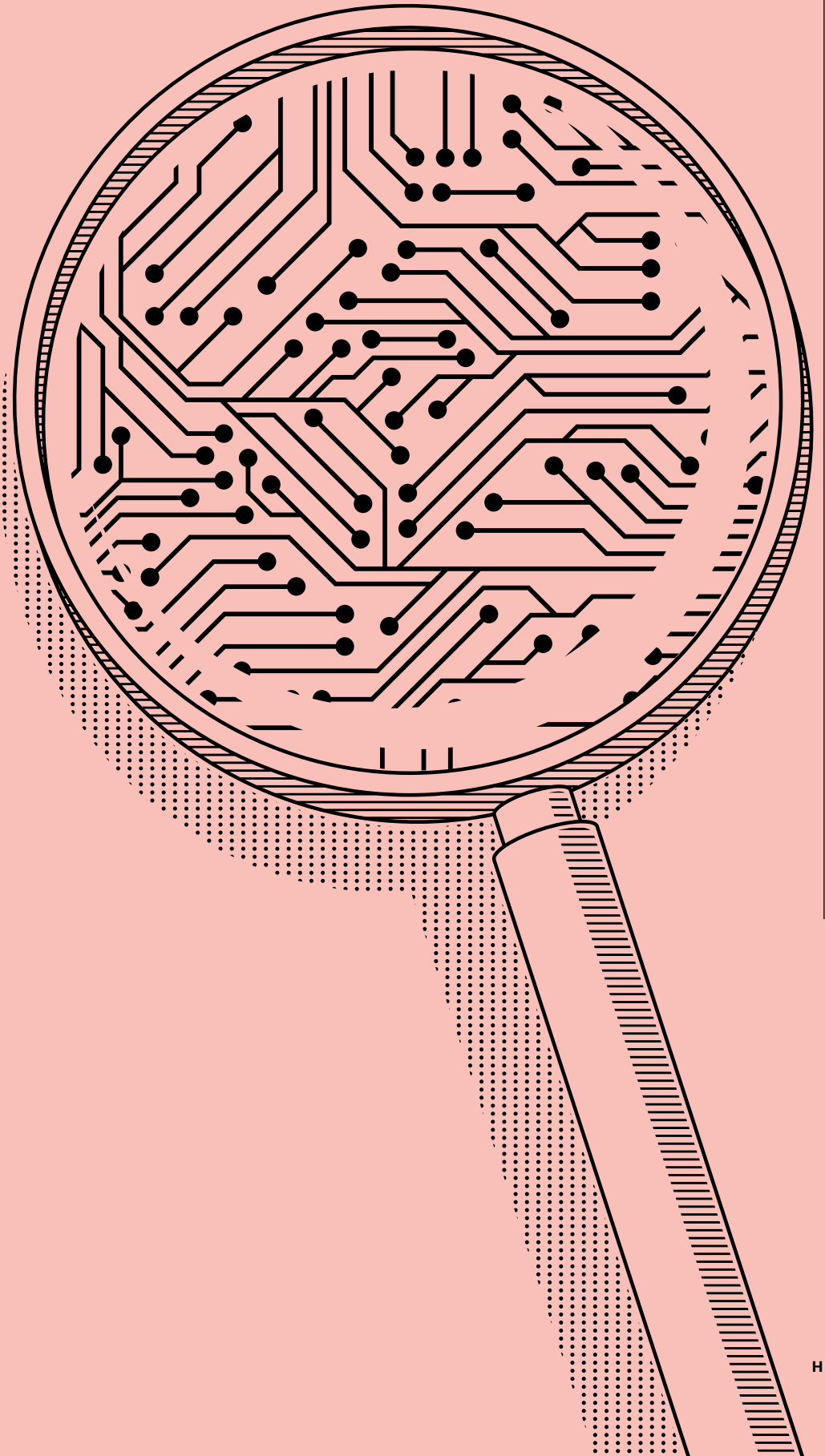
Several models are already safely and successfully used; one technology, for example, identifies skin cancer on a photo taken through a specific lens you attach to your phone camera! A Google-developed application can run over 50 sight-related diagnostics from a single eye examination and a start-up specialising in radiology has algorithms that diagnose lung cancer from a chest X-ray. Imagine the positive impact such applications can have in communities located far away from major specialist centres, communities so numerous in Brazil.

There are other examples of technologies that assist remote patient care: an American start-up uses AI to analyse smart watch data to diagnose diabetes without using a single drop of blood, with 85% accuracy. Even for primary care there are solutions like ADA, a Canadian chatbot that discusses symptoms with users and suggests possible diagnoses with daunting assertiveness.
Whether you consider the clinical, experiential or financial impact, AI gives scalable access to quality health services!

At 3778 Healthcare, we are a driving force behind AI research.
Among the projects we've already implemented is a predictive model for high-risk patients. Based on the health history of an organisation's members, our model predicts and indicates who may become a high-risk patient over the next 12 months. Anticipating possible health events and undertaking a preventative approach could have a huge impact on the health of individuals and populations.
In a clinical context, we have meaningful data which allows us to predict the duration of a hospital stay for a given patient, starting three hours from admission. It's hard to believe we can estimate how many days a patient will stay in hospital and brief whole clinical teams on possible complications and areas that demand attention.

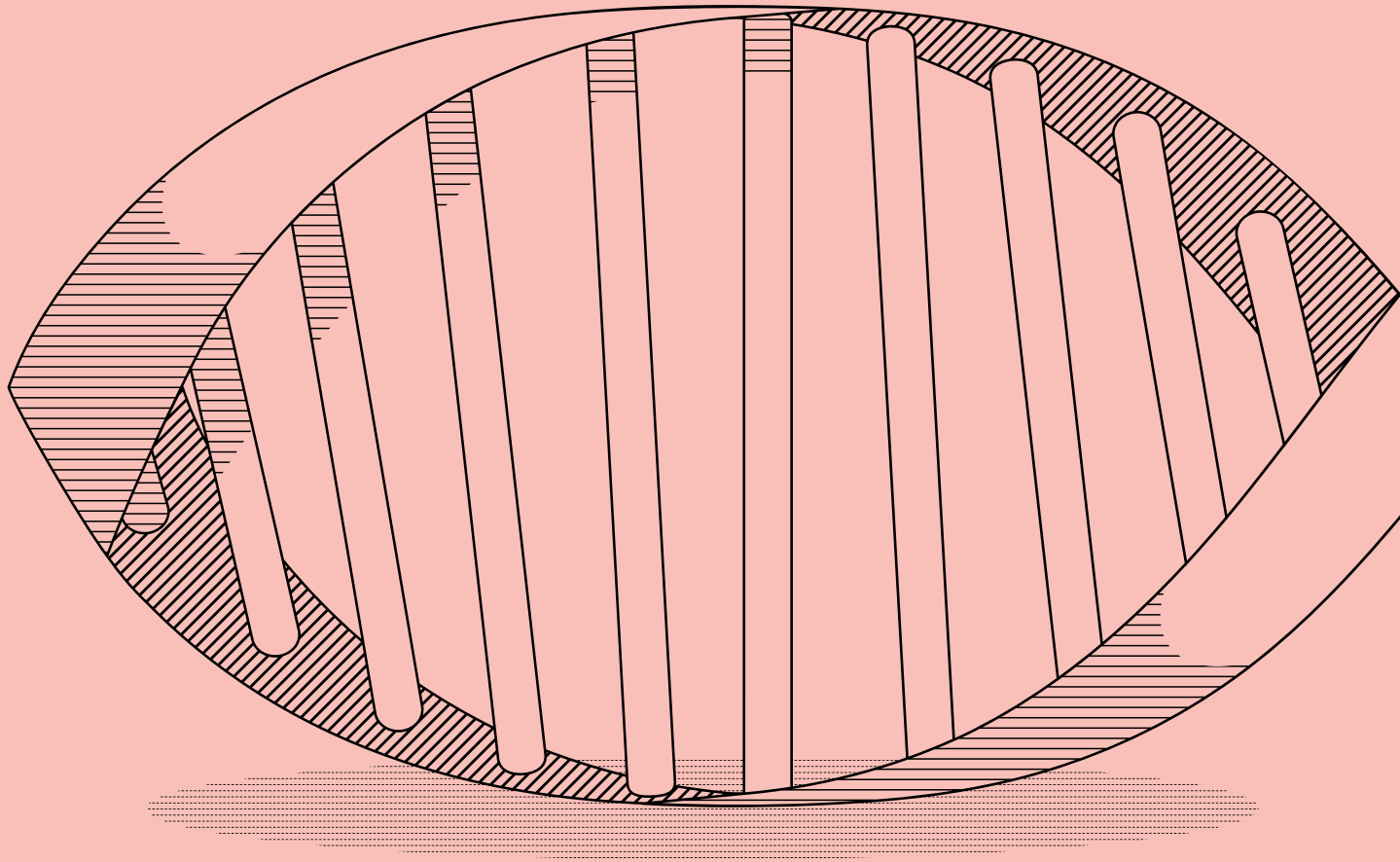
No less challenging are some of our new projects. The first is a joint project with Latin America's largest public radiology service, where we use neural networks to estimate brain age through magnetic resonance imaging; forming a basis to predict the onset of dementia. Another is a system of predictive algorithms to increase patient engagement, tailoring and advancing recommendations and continually learning better ways to relate, taking into account patients' preferences and clinical needs.

Amidst the hype however, there is need for a word of caution: AI isn't always the best tool for every situation, even when it's analysing or classifying statistics within a large data set. Technology does not drive innovation. A restless, questioning mind leads to new solutions – and we sometimes reinvent old tools to deliver these. Cutting-edge technology can make us soar, true. But the desire to fly must come from within ourselves. •



GUILHERME SALGADO

Is a medical doctor in Brazil. He graduated from the Universidade Federal de Minas Gerais (UFMG / Federal University of Minas Gerais), with a Medical Residency in Occupational Medicine from its Clinics Hospital and an MBA in Executive Management from INSPER. In the book, Patologia do Trabalho (Work Pathologies), he is co-author of the chapters 'Princípios e Práticas de Promoção da Saúde no Trabalho' (Principles and Practices to Uphold Occupational Health) and 'Tensões por Trocas Térmicas: Calor' (Thermal Exchange-Related Tension: Heat). His extensive professional experience includes working as associate consultant at Rene Mendes Consultoria, consultant to the International Labour Organization, benefits superintendent at Safra bank, consultant to the Health Cesar Institute, new business consultant at Sírio-Libanês hospital and head of business development at Kunumi Artificial Intelligence. Guilherme co-founded TEG Saúde and is ceo at 3778 Healthcare.



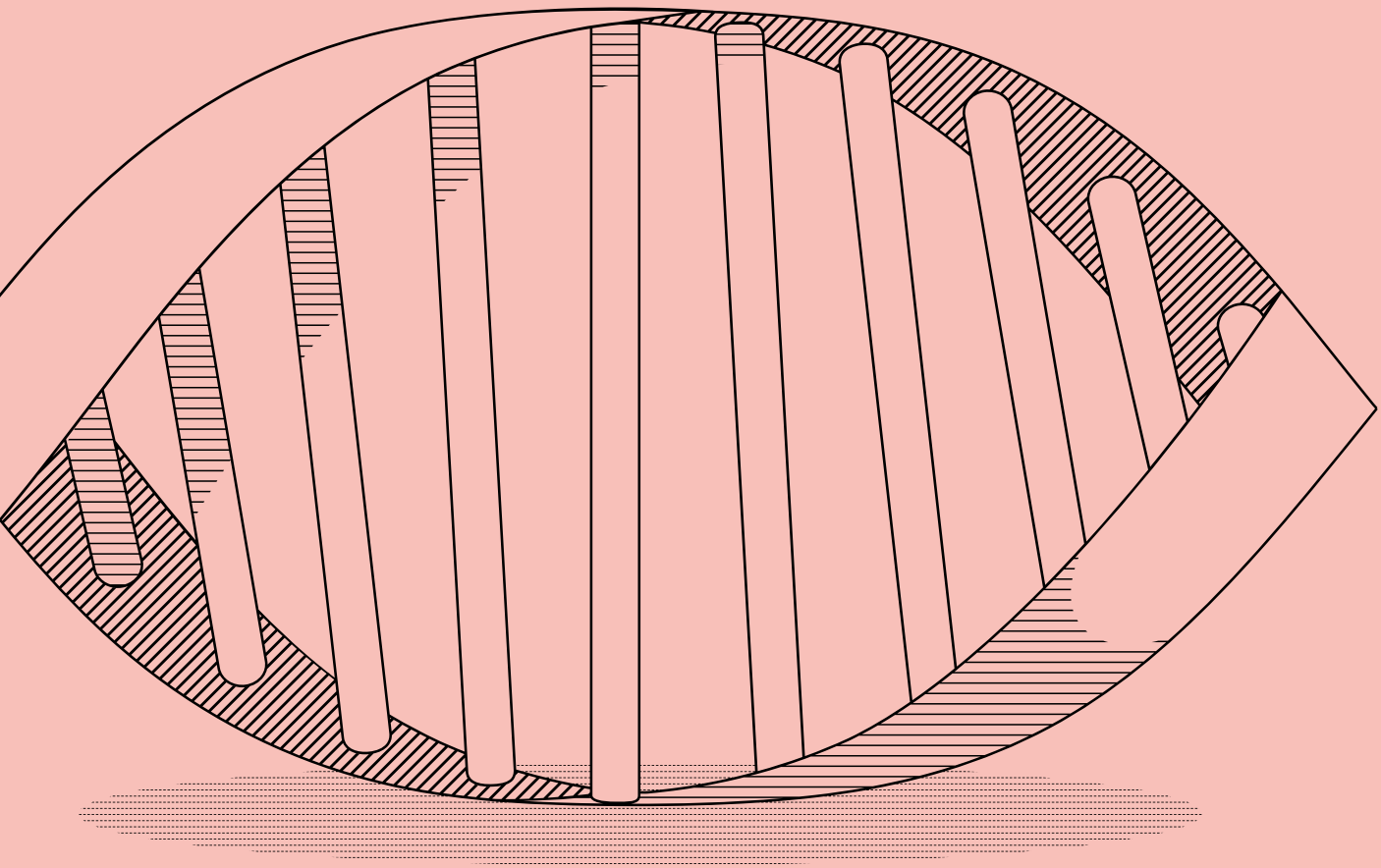
IMMORTALITY: FACT OR FICTION?

Having read articles discussing how there's a strong possibility mankind will conquer its oldest and ultimate battle – that against death – FULLCOVER talked to one of Portugal's most renowned genetic scientists, Maria do Carmo Fonseca, about her views on this and other matters concerning medicine in the future.

Precision not genetic medicine

Her first point is to make it clear the expression 'genetic medicine' is incorrect. According to Professor Fonseca, the proper term is 'precision medicine' - a concept developed by the current director of the National Institutes of Health in the United States, Francis Sellers Collins. This clinical geneticist believes a greater understanding of the human genome will result in a new way of doing medicine, which he calls, 'precision medicine'. It allows us to identify what's chemically wrong with our body and causing disease, with a precision that has up until now, been unavailable. Such knowledge allows us to use medication that prompts the right molecular alteration, which, in most cases, results in a genetic change. So genetics underpins precision medicine.

Precision medicine will not resolve every health problem, but it is already saving lives, as is the case of cancer, for example. As cancer is a disease that results from genetic alterations, the knowledge the scientific



community is gaining about the cancer genome has led various scientists to develop methods to attack that molecular change.

Old battles, new techniques

New techniques for diagnosis, such as liquid biopsy (blood analysis), give us an insight into molecular changes. Professor Fonseca cites an example: "Here in the hospital we've had cases of patients with advanced breast cancer who had already exhausted all the available treatments. We did a liquid biopsy, which allowed us to detect specific alterations that could be treated with an alternative medication, which was tried with positive results. Liquid biopsy demonstrates the advantage of precision medicine."

When it comes to eradicating cancer, she's optimistic: "Although there are those who say we are losing this battle, I don't agree; we've been winning more and more battles. We're able to treat a growing number of cancers and keep people alive for longer periods of time. I believe we're going to see new victories; immunotherapy is a new weapon we already have, which consists of teaching our own immunological system to destroy cancerous cells. And then, more radical is the idea a person can live forever without their body, linking biology to the machine..."

Biology vs technology

Will human beings attain immortality, as the doctrine of transhumanism teaches, foreseeing the end of death? Professor Fonseca answers by saying that although we keep ageing, we are already adding years to our lives, and the major challenge now is how to prolong youth: "The scientific community and great thinkers are convinced that during this millennium, humanity will succeed in attaining immortality. The *how* is still a big question mark; there are two approaches and we don't know which one will be the first to win the race, or if they'll arrive together."

Professor Fonseca believes all the different specialisms should join forces – biology, related to our ability to make genetic changes, engineering, robotics and artificial intelligence: "Currently, technology is advancing faster and I find the reason for this fascinating. Everything technological is built and controlled by human beings, and we know all the variables. In biology, we try to manipulate and control something that evolved over millions and millions of years - the human body- and this has so many variables it becomes impossible to foresee the consequences of manipulation. All the experiments undertaken in this area demonstrate this is something extremely risky. That's why it appears to me, the technological part – modifying our body with devices we manufacture and control - will advance more rapidly than a biological transformation."

But then, we ask, will humans achieve what they have always sought - to be immortal? Professor Fonseca's answer is clear: "We're working in that direction, but it's a matter of time! The type of 'help' we've already been able to give the human body will certainly keep us more active and enable us to do more

for longer. For example, we'll replace our eyes with sensors and our legs with prosthetics that run faster etc."
What about the role of ethics? She agrees this subject is going to raise completely new issues for ethics and risk management: 'Suppose someone wants to amputate their legs; there's no health problem, but they want to do it to become a top runner achieving the best performance possible. Is this acceptable? And how will we deal with the risk involved in this type of intervention?' Professor Fonseca then suggests that instead of using our hands to work computers and mobile phones, we'll implant chips in our brain and use our own brain to directly control the computer or smartphone.

A new approach – proactively preventing disease

Today we talk about physical and chemical biosensors that will enable the early detection of 'defects' in our body, warning us to the probability of contracting disease and allowing us to take preventative action. Professor Fonseca agrees this area is rapidly expanding: "There's already a number of devices that give us detailed biological information about our body – our heart rate, blood pressure and temperature are a few examples.
The big question is, how are we going to translate this information into something useful? This is where artificial intelligence and big data come in. In order to associate certain patterns of change with a set event, such as the appearance of diseases, we need a history of and data on many people over time. When we have this information, we'll be able to prevent diseases. Here too, we're talking about technological development."
But none of this will be possible without the active involvement of people who are willing to use sensors and share their data during their lives, helping scientists identify and analyse patterns. She comments: "People will need to participate in the health discovery process and we have to think about how we can find incentives for them to do so."'
Professor Fonseca acknowledges insurers have a very important role in this process, both in promoting campaigns for good life styles and rewarding customers who have positive health indicators.

The future's here today – for everyone

Will the general population have access to this new medicine or can only the rich become immortal? Professor Fonseca believes the latter will be unacceptable, and in the same way mobile phones and then smartphones are now generally used, there'll be strong social pressure for these advances in medicine to cross divides and become widely accessible. If they don't, we risk a social breakdown. The great advantage of shared information is that if someone is able to be immortal, everyone will know about it.
Professor Fonseca leaves a final message for FULLCOVER readers: "It's essential the general population's prepared to face the new world technology promises us. We cannot however allow ourselves to be dazzled by innovation; we must promote a critical spirit of analysis, because many will come to nothing. The educational system should not be so focused on information, but rather on developing the students' capacity for critical thinking, stimulating them to compare and analyse the benefits offered by an innovation, alongside the risks involved. It's essential to open up a debate on these subjects, but a debate based on reasoned arguments and not thoughts. With the proliferation of blogs and opinion leaders, more than ever we need arguments based on scientific facts, because we're going to be confronted with a world that's increasingly technological. And this isn't five or 10 years down the road, it's already happening. We must act quickly, because the future's already arrived, it's here now, today." •

MARIA DO CARMO FONSECA

Is Professor at the University of Lisbon Medical School and President of the Institute of Molecular Medicine João Lobo Antunes (IMM). She is member of several scientific organizations such as the European Molecular Biology Organization and the Portuguese Academy of Sciences, and she is editor for the Journal of Cell Science and the RNA journal. She currently chairs the Scientific Advisory Board for GenoMed, a spin--off company of IMM dedicated to molecular diagnostics. She was visiting Professor at Harvard Medical School (2011 to 2013), and Director of the Harvard Medical School--Portugal Program (2009 to 2015). She has received the Comenda Ordem de Sant'Iago da Espada Distinguished Career National Award (2001), the Iberian DuPont Science Award (2002), the Gulbenkian Science Award (2007), Prémio Pessoa National Award in Arts, Science and Culture (2010), and Prémio D. Antónia Ferreira Portuguese award for Entrepreneurial Women (2013). Professor Fonseca has authored more than 150 scientific publications with a total of approximately 10 thousand citations. Her lab is known for studies on RNA biology. Her work has contributed to a better understanding of how perturbations in RNA metabolism regulation contribute to genetic diseases, including cancer.

THE INTERNET OF THINGS

Although everybody may think the term the 'Internet of Things' (IoT) is a novelty, in reality it was first used publicly in 1999. Kevin Ashton, a Procter & Gamble executive, used it in a speech to explain ways to manage the company's product distribution, discussing attempts to somehow connect physical packages to the Internet.

BY **CESAR RODRIGUEZ**, AXISMED

Put simply, the IoT is defined as a gigantic network of 'things' (including people, buildings, cars, airplanes etc) interconnected individually or collectively. Such a network allows any object to generate useful information and share it in real time (or with some latency) with other 'things' or people on the network (wherever they access the Internet). With this information, people can make concrete decisions about problems or needs immediately.

Let's look at a real example so we can put the theory into practice. The IoT currently allows an enologist at a wine lab in Barcelona decide in real time whether to generate more humidity in the soil of an inland Australian vineyard where the next harvest is growing right now.
At present we're witnessing the start of many transformations the IoT will bring to the world economy and existing social structures. It's safe to say we haven't seen 10% of the transformation it will bring into our lives over the next 20 years! Specialists agree that in the coming years, artificial intelligence and the IoT will accelerate a radical transformation in our society. These changes will be the most profound in the history of mankind, well beyond the Internet or industrial revolution or the invention of writing.
But what kind of an impact will it have on the insurance industry? The IoT will be crucial to maintaining competitiveness and efficiency. It also presents a massive growth opportunity for the industry, helping to define new business models with greater flexibility, better suited to individual customers. Some insurers can already change your car insurance premium based on your driving profile (pay as you drive), relying on information transmitted by a sensor built into your car. It monitors your driving time and speed, and whenever you brake sharply. The same already happens with health care. Connected devices enable us to see just how healthy a patient's lifestyle is, basing the premium on this (pay as you live). Insuretech companies are now a reality and unless traditional players speed up their digital transformation processes, they will miss out on new opportunities.

But the IoT also raises a big question: how invasive is it of your privacy? Will our entire lives fall under surveillance when people, and everything we use day-to-day, exchange information about us and our families? Who will hold such information and how will they use it? We need to properly regulate the use of personal information floating around the networks and with the IoT becoming part of our lives, we need a new legal and ethical framework for this digital world.

The dawn of a new era
We are merely at the dawn of a new era. GSMA data forecasts show that in 2025 there will be 25.2 billion 'things'" connected across the world and we will have communications networks with capacities exceeding fibre optics or 5G. This will make the dream come true: smart cities, planes that fly themselves, control over food growth and weather to fend off storms and protect agricultural operations, or to generate rain over drought-afflicted regions, smart vehicles to predict accidents and chip implants to detect health issues. In short, new social, business and lifestyle models we don't yet know. •

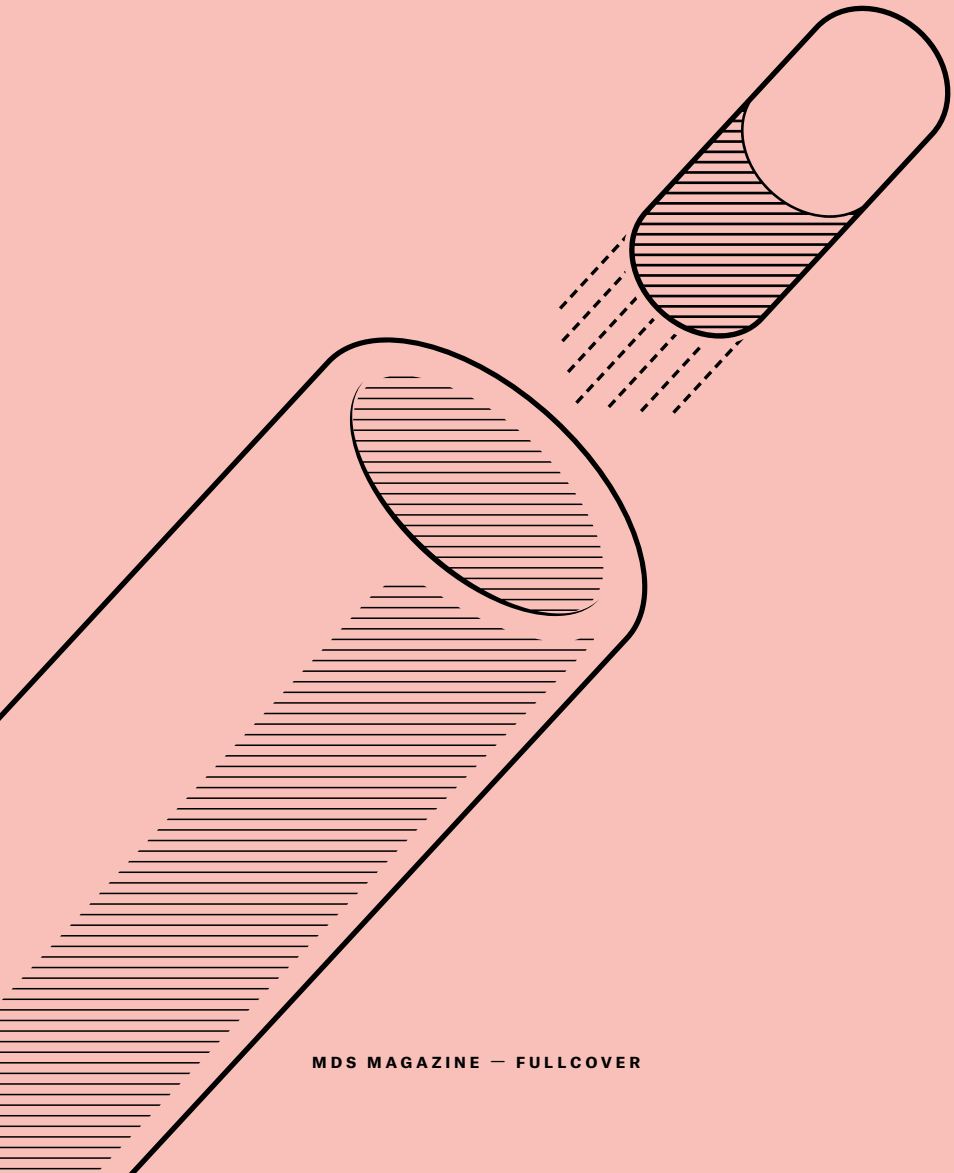
CESAR RODRIGUEZ

Born in Barcelona in 1975, Cesar Rodriguez is a telecommunications engineer with an MBA from the ESADE Business School, and a diploma from the Advanced Management Programme at the Kellogg Business School. Much of his career has been with Grupo Telefónica, where he has spent 10 years as an executive in several digital development roles in Spain, Colombia and Brazil, and in the Corporate Global Division. He is ceo of Axismed, a Grupo Telefónica affiliate, focusing on developing more efficient health management tools for the wider population. Cesar speaks Spanish, Catalan, English and Portuguese.

AGEING – A CHALLENGE OR THREAT TO PRIVATE HEALTH INSURANCE?

An ageing population is doubtlessly one of the trends having the greatest impact on Western society, both at a demographic and a socio-economic level. Portugal and Spain in particular are being affected by an ageing population and research suggests both countries are close to Japan's average.

BY **JOSEF BREM**, MUNICH RE



Japan currently has the most aged population in the industrialised world with one in four people predicted to reach 100 over the next 20 years. There are however, a number of aspects to consider in order to better understand the causes of longevity and its context – for the insurance sector and the insured.

Firstly, do we live longer because we are now fitter or because our health has improved significantly? These factors are certainly contributors. On the one hand, we're more aware of health and well-being; and this is something that will continue to grow. On the other hand, there's a growth in the number of people with diseases, mainly chronic ones, being cared for by the public and private healthcare systems. Our bodies are similar to machines; the greater the investment in maintenance, the longer the lifespan. In short, we will be able to live longer if we maintain fitness levels and care for our bodies.

In this context, we should be mindful we're ageing in an ever-changing and complex environment. Medical, technical and pharmacological treatments are progressing rapidly

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He has worked for Munich Re for already 33 years, both in London, Munich and Madrid in various functions. Starting as a Casualty Underwriter for the London Market, he headed the Casualty Underwriting in Madrid for more than 12 years. For another 7 years he headed the Capital Management Unit in Madrid and for the last 6 years he is Director of the Centre of Competence Health for Spain, Portugal and Latin America in Madrid.

and increasing life expectancy. Such developments however, result in higher costs for health service providers, and the impact of spiralling medical inflation creates greater sector uncertainty and concerns for the sustainability of the current business model.

Technology is similarly changing the traditional relationship with the insured. E-Health or Digital Health embraces a wide range of new concepts and tools, redefining the parameters of healthcare provision, and, quite probably, the business model as well. Identifying what developments will have the biggest impact –mainly for the eldest of the population pyramid– poses one of the biggest challenges and investment risks for the sector. Upon reflection, rather than wait to see what happens and then react, would it not be better to disrupt the traditional business model?

As I see it, the position our sector currently adopts regarding the ageing issue is still defensive; waiting and gradually adapting to changes in order to avoid little-known future outcomes. The reality is, as the policyholder ages and cost of healthcare service increases, it impacts on the premium cost. In order to continue to be able to afford health insurance cover, policyholders turn to cheaper insurance that offers more limited benefits. This dilemma illustrates the clear imbalance between the value we add as a sector and how we meet the needs and expectations of this part of our population. Our solutions do not seem to be completely satisfactory for our eldest policyholders.

In light of these factors, we should focus on changing some of the widely-accepted business practices, particularly for this ageing segment of our population. Policyholders are ever more independent in their decision--making, they're better informed and, above all, more aware of their health. The insured, or patients, want to get actively involved in the decision-making process, they want to be offered –through new technologies– access to doctors' contact information and they want to be supported with self-care and have their specific age-related needs met.

Prevention is also a key to successfully manage the risks associated with ageing. For every Euro invested in prevention, the public health system estimates it will save around 25€ (Dr Carles Blay, at the 10th insurance leaders meeting, Barcelona: ESADE / Medical School, UVIC, 2 October 2018). A continuous medical follow-up for elderly patients is a vital component of prevention so it would be advisable to strengthen the role of the general practitioner to that of a 'managing doctor'.

Our traditional approach to insuring elderly people fails to appreciate their overall well-being or social influences. Such is our focus on treating a physical problem, we fail to consider their emotional well-being. A doctor, for example, may focus on treating high cholesterol, but not pay attention to that patient's environmental or social influences. Emotional well-being is crucial for everyone, particularly ageing people. By having a general practitioner as a 'managing doctor', it would result in a closer patient or insured relationship, a greater focus on prevention and fewer physical issues. We currently have the tools and the technology to do this; it's basically how we approach it.

In addition, public and private healthcare providers must work more closely together. This ageing phenomenon challenges both health systems and society as a whole. It is therefore vital to collaborate more, particularly as the private sector will need to provide cover and services after people retire.

The ageing trend in Portugal and Spain is unrelenting and although the traditional concept of health insurance is facing important challenges, medical advances and technological developments –along with a greater emphasis on prevention and well--being– will open new windows of opportunity. Furthermore, a high percentage of our elderly population holds considerable purchasing power – this should encourage all sector agents to adapt their offer to meet their needs.

Looking at our current policies, we could extend them with new service concepts (maybe franchisees), focus more on emotional and well-being care or introduce the 'managing doctor'. Such elements would add value to the core proposition for this section of the population. And last but not least, it will improve our relationship with the elderly so it becomes less transactional and more humane. •

IS THERE ANY FUTURE TO HEALTH INSURANCE?

The question points to the major upheavals coming to the health insurance industry. Societal megatrends, the promise of new technology, shifts underway in healthcare, technological leapfrogging by developing countries, regulatory shocks and many other disruptions are reshaping the health industry at an unprecedented pace.

BY **JEAN-LOUIS DAVET**, VYV GROUP

Population aging, increased healthcare expenditure, rising inequality contributing to global instability are among the major societal trends with expected far-reaching economic and socio-political consequences.

The convergence and combination of new technologies and scientific progress is reshaping the health care system and the health insurance sector.
Genetics allows the identification of genetic predispositions for certain diseases. Gene therapy, the design of personalized treatments. Nanotechnology holds enormous potential with its promise to optimize the precision of drug delivery. In the cognitive sciences, research on brain-machine interfaces, which decode physiological signals from the brain and convert them into outputs, already enables the restoration of bodily movement and function. Quantum computing, which opens new possibilities in data processing, accelerating the process by a million-fold or more, could provide breakthroughs in many disciplines, including drug discovery and artificial intelligence.

Shifts in the healthcare system toward patient-centred and outcome--based delivery models rely on patient empowerment and connected health technologies. The patient's growing power, thanks to unprecedented access to health information and the need for an overhaul of the patient--provider relationship for active patient involvement, is creating new models of care that lead toward more holistic and preventative medical care. The availability of massive volumes of health data has laid the foundation for personal data-intensive processes, which makes data privacy and ethics highly pressing concerns.

Regulation and ethics at stake in the insurance industry
With the globalization of the sector, we observe trends converging worldwide into prudential measures for insurance and reinsurance. The triptych Data--Algorithm-Machine is about to destabilize our anthropological, societal, legal, and ethical frames of reference. The developing, but not yet harmonized, regulation of personal data protection will reshape the way in which data is handled in healthcare and in the insurance industry. Even if the benefits of personal genomics are evident, they do raise ethical, legal and social issues, knowing that regulations on the use of genetic information are not yet standardized across the world.
New competitors are disrupting the health insurance industry: non--traditional operators, whose business and products leverage technologies such as analytics, artificial intelligence (AI) and the Internet of Things (IoT), break with sector business processes across the entire value chain.
New forms of work and economic organization, new communities are reshaping traditional insurance markets, opening up new market segments such as peer groups or interest communities. For example, Facebook counts more users than the population of China, Twitter twice the population of the USA.

Is there any future to health insurance?
Yes, there is. But it is less clear for health insurers... There may be much more accurate health risk assessments, but risk could still materialize, so uncertainty remains. Progress in Epigenetics has proven that external, environmental and behavioural factors affect gene expression, debunking absolute genetic determinism.
Insurance companies must go beyond quantifying and pricing risk, from a curative business model based on reimbursement to more preventative and personalized offers: developing non-insurance offerings such as healthcare services and prevention programmes as a way to change the relationship with their insurees, from short-term transaction to long-term partnership, aiming at improving their health outcomes and behaviours.
The health industry should be able to seize business opportunities. With increased globalisation, international private medical insurance registers an annual growth rate of about 11%. Generating and influencing new communities of interest and making them into new markets and distribution channels might also be future marketing opportunities for companies and brokers.
Insurance companies could also be part of the healthcare system, operating healthcare facilities in an holistic approach to the patient-insuree.
Prerequisite to the future of the health insurance industry is adopting an ecosystem perspective focused on consumers' needs and addressing health determinants. Insurers must build a platform strategy with IT interoperability, acting as gatekeepers to their customers' needs, because ownership of a customer relationship is the only way to reduce the risk of disintermediation by other stakeholders.

The health industry has entered the age of data
New tools and analytics, giving companies and brokers a much deeper understanding of their customers, will allow the delivery of an enhanced customer experience, resulting in increased revenue and improved customer loyalty. To turn collected data into a valuable asset, insurers must break down data silos, connect disparate databases, organize data governance and consider algorithmics as core business. Insurers have to strengthen trust and invest in data privacy & AI ethics because if there is no trust there will be no business. Therefore data protection in the health insurance industry is crucial for the sustainability of the sector. •

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Is deputy CEO of VYV, the largest French health insurer in France, covering more than 10 million people (15% of the population), operating more than 1000 healthcare facilities. Jean-Louis has been the initiator and leader of the group's digital transition, data and platform strategies.
He has also served as VP of ICMIF Board (International Cooperative and Mutual Insurance Federation) and President of the Health Committee of the Insurance Development Forum.
He has been the main driver in the implementation in France of the new EU prudential framework for the insurance industry (Solvency II) and in the development of the mutualist model of health insurance in China.

THE GROUP VYV

French leader in health insurance and services, the Group has developed an ecosystem strategy addressing major health determinants and covering a large range of their customers-patients-residents--insurees' needs.
They have implemented health education programmes including physical activity, exercising and sports adapted to all ages and health statuses. They also developed a service marketplace for their insurees. VYV operates a large network of healthcare facilities in various medical specialties: medical and rehabilitation centres, hospitals, clinics, dental and eye clinics, residential care homes and nursing homes for the elderly, psychiatric institutions and centres for people with disabilities.
Additionally, they own nationwide optical and hearing aid centres, pharmacies, medical transport agencies, medical equipment stores, funeral service agencies, networks of in-home care services and in-home nursing care services.
They have made investments in social and student housing, and innovative projects related to smart, healthy and safe homes and smart cities.
To act as a true ecosystem player, VYV builds partnerships with, and invests in, operators from other industries.