From healthcare to life care

A prescription for transforming precision health

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The healthcare industry is changing rapidly. Technology and evolving consumer preferences are setting the stage for a transformation in the way that healthcare delivers and creates personal, societal and financial value.

Consumers are demanding that healthcare organisations provide the convenience and attention that matches the experience typical in the retail and banking sectors. In response, retail and consumer technology players are extending their healthcare offerings by opening physical and virtual spaces aimed at meeting this demand. Meanwhile, wearables and a growing number of apps are putting consumers' vital signs and medical advice at their fingertips.

There have been crucial developments on the supply side, too. Namely, significant advances in biotechnology and diagnostic technologies have sparked a rapid rise in the application of precision medicine – tailoring therapy to individual patients based on their genes, environment and lifestyles – to serious illnesses. Improvements in sequencing technologies and holistic genomic profiling and the rise of multiomics continue to generate new precision therapies aimed at treating some of the most challenging health issues, from cancer to inflammatory diseases.

But this is just the beginning. This combination of factors is setting the stage for a fundamental shift in the healthcare industry, from treatment to prevention, especially for lifestyle-linked chronic diseases like diabetes. And if players lean into the strategic opportunities afforded by the convergences taking place, they can help turn today's reactive, treatment-based healthcare industry into one that is based on the principles of precision health: a proactive, precise, prevention-based life care system. Doing so will require stakeholders to reimagine service-delivery and payments models, and to work in the broader ecosystem in new ways.

This is not only an opportunity, it's an imperative. In PwC Strategy&'s 2021 global Future of Health report, the 150 healthcare executives surveyed almost unanimously agreed that by 2035, healthcare will be centred around patient needs, and will be personalised, digitised and preventative, with healthcare solutions seamlessly integrated into daily life.[1] Yet today's healthcare system remains largely centred around disease care, with interventions typically occurring only after the patient is sick, making care more costly.

Because precision health integrates prevention and wellness with disease care, no one player has the resources, solutions, skills and data required to meet consumers' needs across their lifespans. A precision health system requires an ecosystem approach involving a range of stakeholders, such as healthcare providers, payers, pharmaceutical companies, tech firms, employers, governments and social organisations. These stakeholders will need to form holistic solutions to span the breadth of a precision health system.

While there are still issues surrounding costs, there is an immense opportunity in the evolution of precision medicine. The transformation to precision health holds the potential not only to improve human lives but also to save billions by preventing disease; enabling intervention at an earlier, less-costly stage; avoiding misdiagnosis and wrong treatments; and honing drug and diagnostic R&D.

[1] https://www.strategyand.pwc.com/de/en/industries/health/future-of-health-2021.html

The transformation to precision health

To date, precision medicine has made strides by improving the ability to get the right drug to the right patient at the right time. But it is largely focused on specialty care for people who are already sick. The first personalised therapies – such as autologous CAR T-cell therapy, to treat certain blood cancers – in later-line treatment have reached the commercial market in recent years. The narrow focus has meant high R&D costs are spread across small patient populations, resulting in a high price tag for patients and payers. CAR T-cell therapy can cost more than US$500,000 during the treatment period[2], while gene therapies for spinal muscular atrophy can cost anywhere from US$100,000 annually to US$2.1 million for a single, lifetime dose.[3]

A fully developed precision health system would offer a path to value. It would help guide patients' health and well-being as a part of everyday life. It would start not with the sick individual, but with understanding the individual before they're sick, identifying risks and opportunities. It would encompass an understanding of the individual's genetic predisposition to disease and risk factors; epigenetic and relevant biomarkers; preventative measures, such as vaccines and scans; and regular health and wellness monitoring.

Enabled by advanced technology, and informed by human ingenuity, analysis of the individual's healthcare-generated and self-generated data would quickly identify warning signs and enable early intervention. When individuals get sick, they would receive treatment earlier, in a more precise manner, and with better outcomes and fewer side effects. Care-giving would expand beyond the traditional healthcare roles to include specialists from adjacent fields, like nutrition and fitness. On a small scale, projects are under way that show the potential of such an approach. In Saudi Arabia, the development of a futuristic "smart city" called Neom is providing a potential platform to build a precision health system from the ground up.[4] The vision is to develop "an integrated health, well-being and biotech ecosystem that goes above and beyond traditional medical care – an unparalleled end-to-end system entirely centred on the individual."[5]

[2] https://www.pharmacytimes.com/view/study-finds-total-cost-of-care-for-car-t-post-treatment-events-can-exceed-1-million
[3] https://fortune.com/2020/02/07/zolgensma-high-drug-prices/
[4] https://www.cnbc.com/2022/10/25/neom-saudi-arabia-pushes-ahead-with-its-sci-fi-city-vision.html
[5] https://www.neom.com/en-us/sectors/health-wellbeing-and-biotech

Value creation opportunities

Precision health represents a break with tradition. And for such efforts to work, the business case needs to be strong. Simply put, the system needs to learn how to assess and create value in a different way. An enhanced focus on wellness and prevention as part of everyday life not only holds the promise of improving patient health but of cutting healthcare costs by heading off costly medical conditions and spurring helpful interventions. On a population-wide scale, the savings could significantly reduce national health spending and improve productivity through reductions in presenteeism and hours of work lost to illness.

But the business case often will depend on the disease realm. Preventative spending for most neurological diseases likely would yield a low return because today's therapies slow down, but don't prevent, the conditions. By contrast, preventative dollars targeting cardio-metabolic diseases and certain cancers and infectious diseases likely would yield a higher return because existing lifestyle interventions, screenings and vaccines can prevent the onset of these costly conditions.

For example, the CDC estimates that more than 34 million Americans have diabetes and that 88 million US adults are pre-diabetic.[6] About one of every four dollars of US healthcare costs is spent each year caring for people with diabetes. The annual direct medical cost is estimated at US$237 billion, and another US$90 billion is lost due to reduced productivity. Yet, among at-risk patients, the incidence of type 2 diabetes can be cut 58% with lifestyle intervention and by 31% with the first-line treatment metformin, compared with a placebo, a study found.[7]

Use of precision molecular diagnostics or pharmacogenomics for six common conditions – cancer, diabetes, heart disease, hypertension, lung disease and stroke – has enormous potential to prevent disease by identifying those at risk and enabling prophylactic therapy, US researchers found.[8] Over 50 years, a 10% reduction in disease incidence would generate US$33 billion to US$114 billion in economic value, depending on the condition, in the form of longer, healthier lives.

The precision mentality also has an important role to play in drug and diagnostic R&D. A precision approach promises to cut total costs by identifying the most promising drug targets in stratified patient populations, resulting in higher efficacy and a higher probability of success for clinical development.[9]

By leveraging a computational-knowledge network that merges biomedical, clinical, and social and behavioural information, precision medicine also holds the potential to improve efficiencies in clinical trial processes, as well as accelerate clinical development.[10] Even a conservative estimate puts the cost savings of using precision medicine over current, conventional methods in drug development at 17%, leading to a potential annual savings of US$26 billion for the industry worldwide, notes a PwC Strategy& report.[11]

Payers, however, are concerned about the rising costs of innovative therapies, such as CAR T-cell therapies (US$200,000 to US$300,000), and costly prevention initiatives rolled out on a broad scale. Collection of real-world evidence to show the value of precision therapies and prevention initiatives will be necessary to allay this concern.

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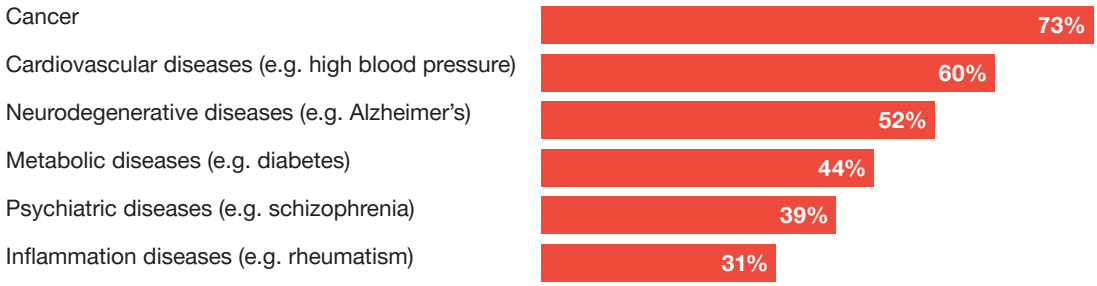
6 https://www.cdc.gov/chronicdisease/programs-impact/pop/diabetes.htm
7 https://www.nejm.org/doi/full/10.1056/nejmoa012512
8 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6481305/pdf/nihms-1006350.pdf
9 https://translational-medicine.biomedcentral.com/articles/10.1186/s12967-021-02910-6
10 https://nam.edu/wp-content/uploads/2016/09/Realizing-the-Full-Potential-of-Precision-Medicine-in-Health-and-Health-Care.pdf
11 https://www.pwc.com/gx/en/industries/healthcare/publications/capitalizing-on-precision-medicine.pdf

Turning precision towards prevention

The consumer has an important role to play in this transformation. The development of a precision health system would require a substantially increased focus on prevention. A PwC survey of 1,500 people in seven countries – France, Germany, Italy, Japan, Spain, the UK and the US – found strong consumer appetite for prevention. Among respondents, 67% reported they were concerned or very concerned about preventative healthcare. The motivation for embracing prevention varies, with a third of respondents saying they do so because they value living every moment to the fullest and a quarter saying they highly value extending their lifetime.

The precision approach to prevention encompasses not only a complete understanding of the individual's medical and family history but also insight into their lifestyle and behaviour choices, as well as their life circumstances. For example, patients with a family history of hereditary conditions with known mutations could be tested so that those at increased risk could take steps to prevent the disease from manifesting itself or increase screening to catch the condition at an earlier, more treatable stage. Our global survey found that cancer is consumers' top target for prevention, followed by cardiovascular disease and neurodegenerative conditions.

Exhibit 1 Top priorities for disease prevention among consumers



Souree: PwC survey of 1,500 consumers in Franc, Germany, Italy, Spain, the UK and the US. (Note: Respondents were asked to identify their top three choices.)

The US integrated payer–provider health system Geisinger is leveraging genetic information to prevent disease and get an early jump on treatment through its voluntary MyCode programme.[12] Among the targets are hereditary breast and colon cancers, familial hypercholesterolemia and heart disease. Since its launch in 2007, the project has sequenced DNA from nearly 185,000 of its 300,000 participants, analysed more than 142,000 sequences and returned clinically actionable results to nearly 3,300 people at increased risk for more than 30 health conditions.[13] Although results aren't always actionable, the test also can provide patients with valuable information about probable genetic causes for neurodevelopmental and psychiatric conditions, including autism, epilepsy, bipolar disorder and schizophrenia.

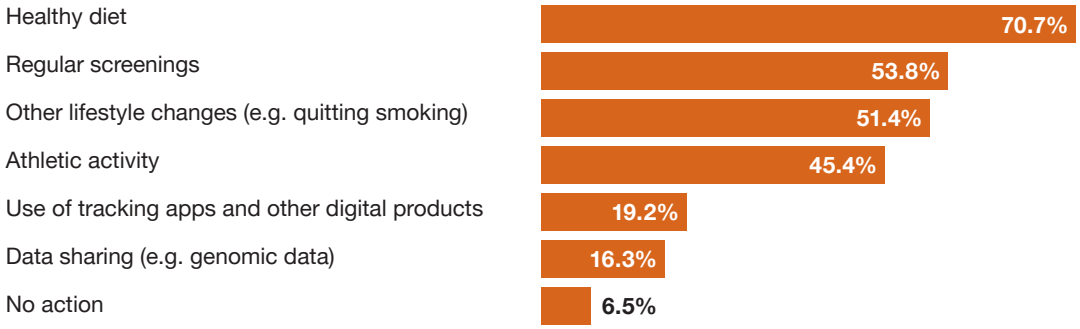
A precision health system also would leverage home monitoring systems, patient wearables and a variety of digital health apps, all of which have the potential to vastly increase the amount of real-time data that can be used for prevention purposes. When this data is synthesised and connected to the electronic health record, it can alert providers to early warning signs and enable them to create a prevention action plan with the patient. In August 2022, the US government awarded researchers US$37 million to study whether an Apple Watch with a corresponding iPhone app can help prevent strokes while reducing blood thinner use among patients with atrial fibrillation.

[12] https://www.geisinger.org/precision-health/mycode
[13] https://www.geisinger.org/-/media/OneGeisinger/pdfs/ghs/research/mycode/mycode-newsletter-spring-summer-2022.pdf?sc_lang=en&hash=D184DBBC7C097B76C4C73FB1D5B3574D

Boosting interest and affordability

One challenge is that while most consumers are interested in or already engaging in wellness or disease-prevention activities, their preferences lean heavily towards the more traditional approaches like eating healthy, getting regular screenings and making better lifestyle choices. Of all survey respondents, those in the UK reported the highest level of use of or interest in digital tools, at 29%; respondents in Japan had the lowest, at just 3%. Globally, older consumers are the least likely to utilise apps, but even among participants younger than 45, only about one-quarter lean towards digital solutions.

Exhibit 2 Top prevention actions and habits among consumers



Source: PwC survey of 1,500 consumers in Franc, Germany, Italy, Spain, the UK and the US. (Note: Respondents were allowed to give multiple answers.)

The survey also found that affordability is a major barrier to prevention. Nearly 50% of respondents cited inability to pay for prevention as the biggest hurdle to investing in prevention, with lack of understanding of prevention and no access to prevention coming in a distant second and third (at 23% and 20%, respectively). These findings show that while the precision health business model needs to evolve to incentivise people to take more responsibility for their health, affordability must be taken into account.

These findings reveal that there is work to be done to boost consumer adoption of mobile health tools, which help integrate prevention into daily life and enable collection of the health and consumer data that help inform prevention efforts. The survey also indicates the need for patient education on the health benefits they can reap from data sharing and analysis.

A closer look: What the results from German respondents reveal

Among Germans respondents, 72% said they are “interested” or “very interested” in preventive healthcare, a figure slightly above the international average (67%), only surpassed by Spanish respondents (82%).

However, most Germans are reluctant to spend a significant amount of money for preventative healthcare measures, and their willingness to pay ranges below that of respondents from other countries. Half of German respondents would invest no more than US$100 annually in health prevention. On the other hand, just a mere 6% said they would pay between US$500 and US$1,000 per year for preventative measures – as opposed to 15% in the US – and only 2% would spend more than US$1,000 annually (US: 8%). This lower willingness to pay could partially derive from the fact that German health insurance coverage usually offers broader services without additional costs, in contrary to the US for instance. Patients in Germany are simply not as used to additional healthcare costs.

Most respondents from Germany focus their health prevention on basic levers such as a healthy diet (72%) or athletic activity (55%) – with a higher share than the average results. The use of tracking apps (18%) or sharing personal health data (17%), however, is less popular among German respondents. Additionally, almost half of German respondents state that they lack the financial background to be able to pay for preventative measures (44%). When those surveyed were asked whom they would entrust to manage their personal healthcare prevention, 35% of German respondents stated they would entrust medical doctors with prevention measures. This figure does range below the share of US respondents (50%) as well as the average share of people (45%) who put more trust in physicians. Interestingly, another 28% of German respondents would grant family members access to their health data, as well as 19% who would entrust new types of medical specialists, such as “preventists” specialised in prevention measures. This makes country-specific solutions seem like a viable requirement in order to foster healthcare prevention.

The expanding terrain of precision diagnostics and treatment

When people do get sick, the future precision health system would be designed to get the right treatment to the right patient in a shorter time frame – and at a lower cost. Underpinning this effort are precision therapies and their companion diagnostics, which have the potential to contribute to greater affordability. The revolution in cancer treatment that began decades ago, sparked by discoveries in tumour biology, is accelerating thanks to continued advances in technology and genomics. These new tools enable clinicians to diagnose cancer more precisely and, in turn, treat cancer more precisely. Treatment has evolved from one-size-fits-all drugs differentiated by tumour type to therapies tailored towards specific mutations and protein expression levels in individual patients’ tumours, along with a deeper understanding of combination therapies.

A bigger diagnostic toolbox

The global market for precision diagnostics is expected to grow from today's US$50 billion to US$60 billion to almost US$144 billion in 2028, according to research firm estimates.[14] Much of that growth will be in oncology as the global burden of cancer increases. The World Health Organization estimates that the number of new cancer cases globally will jump from 19 million in 2020 to almost 30 million in 2040. But opportunities are also expanding outside the oncology realm.[15]

Genomics

Genomic testing enables precise diagnoses of such conditions as neonatal diabetes, newborn seizure disorders and a hereditary form of high cholesterol – knowledge that, again, determines the best treatment options. A genotype test for the hepatitis C virus allows doctors to prescribe the most effective antiviral medication.[16]

Emerging diagnostics

Next-generation sequencing, liquid biopsy, proteomics, multiomics, multiplex testing, and digital diagnostics have the potential to more precisely diagnose illness and speed response by enabling providers and patients to select the best therapy. While typically associated with oncology, emerging diagnostics have applications in other specialties. Already, the multiplex assay that tests for influenza and covid-19 offers quick, accurate diagnosis for individuals with multiple symptoms and helps health systems address two major public health threats.[17] A German firm has developed a digital speech biomarker to diagnose dementia in patients and trial participants. The tool has been found to be a reliable indicator of cognitive decline in early dementia clinical trials.[18]

Leveraging high-tech diagnostics to see into tumours

In recent years, tumour profiling has gained ground as a diagnostic tool driving precision therapies for cancers, including certain lung, skin, breast, colorectal and ovarian cancers. The Tumor Profiler study by Swiss university hospitals and Roche aims to expand the knowledge base and use insights to create clinical decision–support tools.

The project combines the emerging standard diagnostic approaches of targeted next-generation sequencing and digital pathology; multiomics, including single-cell genomics, transcriptomics and proteomics; and other tools, such as cytometry by time of flight (CyTOF), imaging CyTOF, pharmacoscopy and 4i drug response profiling.[19]

Researchers are using these cutting-edge technologies to investigate the molecular and functional properties of melanoma, ovarian cancer and acute myeloid leukemia tumours, with the goal of helping physicians better determine which treatments best match patients' cancer to improve outcomes. The project has the potential to expand to other tumour types.

[14] https://www.globenewswire.com/en/news-release/2022/07/14/2479896/0/en/Precision-Diagnostics-Market-to-Reach-USD-143-96-billion-by-2028-Thanks-to-Growing-Emphasis-on-Early-Cancer-Diagnostics-and-Increased-Penetration-of-Advanced-Diagnostics-Technology.html
[15] https://gco.iarc.fr/tomorrow/en/dataviz/isotype?types=0&sexes=0&mode=population&group_populations=1&multiple_populations=1&multiple_cancers=0&cancers=39&populations=903_904_905_908_909_935
[16] https://www.webmd.com/hepatitis/hepatitis-c-genotypes
[17] https://www.acla.com/multiplex-testing-an-important-tool-to-counter-the-spread-of-flu-and-covid-19/
[18] https://www.karger.com/Article/Abstract/526471
[19] https://www.medrxiv.org/content/10.1101/2020.02.13.20017921v1

The precision treatment revolution

Deeper understanding of human and disease biology has fuelled and will continue to drive enormous advances in personalised treatment that can be leveraged by precision health systems. Provider systems will need to better incorporate precision diagnostics into clinical care to facilitate precision therapies and improve patient outcomes. Some approaches that began in the realm of cancer treatment are being explored for their potential for other conditions.

Pharmacogenomics

Expanded use of pharmacogenomic tests could chip away at trial-and-error prescribing for certain conditions, including depression and high cholesterol.[20] Instead of automatically starting a patient on a first-line therapy that might have little effect due to the patient's genetics, physicians could use the patient's pharmacogenomic test results to immediately prescribe the pharmaceutical best suited for that patient, and with fewer side effects.

CAR T-cell therapy

Today, about a half-dozen CAR T-cell therapies, in which the immune cells of the patient or a donor are genetically modified to target a specific tumour antigen, are available for treating certain blood cancers, and more are in the pipeline. Researchers also are working to utilise mRNA vaccines for CAR T-cell therapy against solid tumours and to develop CAR–natural killer (NK) cell therapy, an experimental immunotherapy targeting both liquid and solid tumours. Applications are being studied for other disease areas, including cardiometabolic disorders, autoimmune diseases and fibrosis.[12]

Stem-cell therapy

Treatments using patients' or donors' stem cells have gained approval for some immune system and blood cancers, and could eventually help people with spinal cord injuries, type 1 diabetes, Parkinson's disease, Alzheimer's disease, amyotrophic lateral sclerosis, heart disease, stroke, burns, cancer and osteoarthritis.

Viral vector gene therapy

Viral vector–based gene therapies offer huge potential to treat and even cure hereditary diseases caused by mutations of a single gene, such as hemophilia and spinal muscular atrophy. While the few approved therapies focus on ultra-rare diseases, multiple gene therapies in clinical trials aim for broader indications, such as hemophilia A.

mRNA technology

Made famous by covid-19, mRNA may hold promise beyond vaccines for infectious disease and CAR T-cell cancer therapy. Researchers are studying its therapeutic potential for conditions including heart failure and certain inherited metabolic disorders. In December, Merck and Moderna showed positive results in a trial of an mRNA-based cancer vaccine targeting melanoma.[22]

As new options gain approval, collection of real-world evidence – from traditional health data sources and newer sources like apps and wearables – will be necessary to monitor clinical effectiveness and impact on cost. Generation of this evidence will require close collaboration between stakeholder groups, as well as technological advances and data sharing.

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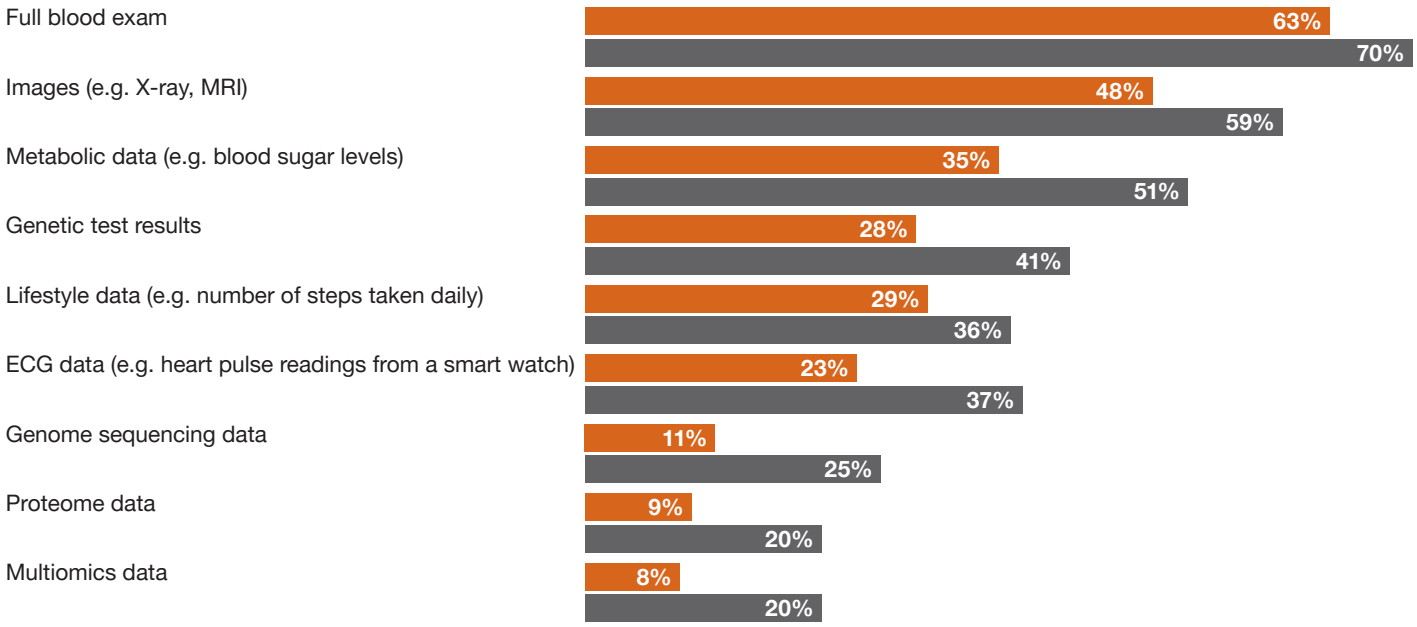
[20] https://www.sciencedirect.com/science/article/pii/S0022395618310069

[21] https://www.nature.com/articles/s42255-022-00537-5#:~:text=CAR%20T%20cell%20therapy%20is,cardiometabolic%20disease%2C%20fibrosis%20and%20senescence.

[22] https://cen.acs.org/pharmaceuticals/vaccines/ModernaMerck-cancer-vaccine-shows-promise/100/web/2022/12?utm_source=LatestNews&utm_medium=Latest-News&utm_campaign=CENRSS

Exhibit 3 Availability and sharing of personal diagnostic data among consumers



Source: PwC survey of 1,500 consumers in Franc, Germany, Italy, Spain, the UK and the US.

Data fuels precision health opportunities

Vast amounts of digital information and advances in data science are creating precision health opportunities that were once impossible to imagine. Data inputs include patient medical records, insurance claims, remote monitoring devices, consumer wearables and apps, and biomedical and genomic databases.

Through data analytics, AI and machine learning, the information can be leveraged to predict and prevent illness; to research, develop and deliver more precise pharmaceuticals and treatment approaches; and to sift through real-world evidence to evaluate drug and treatment effectiveness. In the US, the Food and Drug Administration has approved more than 300 medical devices enabled by AI and machine learning.[23]

Initiatives like Google's DeepMind are expected to result in AI- and machine learning–driven innovations with healthcare applications, while healthcare players are engaged in research and projects that leverage AI and machine learning in an effort to improve patient health. PwC's Bodylogical tool, which enables the creation of a digital twin of the human body, makes it possible for pharmaceutical companies to simulate how a treatment might affect different patients or groups of patients.[24]

[23] https://www.fda.gov/medical-devices/software-medical-device-samd/artificial-intelligence-and-machine-learning-aiml-enabled-medical-devices
[24] https://www.pwc.com/us/en/library/case-studies/seeing-is-believing-bodylogical-helps-a-global-pharmaceutical-company-identify-the-missing-millions.html

AI-based software developed by PwC Switzerland in collaboration with the NeuroTransData network of physicians predicts the effectiveness of any given multiple sclerosis treatment on individual patients. The tool is driven by an algorithm based on more than ten years of real-world evidence from 25,000 patients engaged in different forms of MS therapy. Physicians simply enter a set of patient data to find out whether, for example, a particular patient will likely remain exacerbation-free on a particular medication.[25]

Global data collaborative targets rare lung disease

A global collaboration among academia, industry and patient advocacy groups has established a first-of-its-kind open-source medical imaging and data repository platform aimed at the rare, deadly lung disease idiopathic pulmonary fibrosis (IPF) and other lung-scarring conditions.

About 1% of UK deaths are caused by lung fibrosis; and in the US, IPF kills about 40,000 people a year. The mean time to diagnosis is more than two years, and the average life expectancy after diagnosis is just three to five years. Half of patients with the disease are misdiagnosed at least once, and one-third are misdiagnosed at least twice. These results are driven by barriers to care such as variability in imaging interpretation, disease staging and clinical course, as well as a lack of tools to predict disease progression in individual patients.

The nonprofit Open Source Imaging Consortium (OSIC)[26] crowdsources de-identified imaging and clinical data that has been uploaded to a database developed by PwC and Microsoft Azure.[27] Researchers are using AI to comb through the database to identify patterns and then build algorithms to close the gap between the patient's first visit and diagnosis, and to better predict response to therapy.

"If we have this data that we have in OSIC, we can look at a completely new kind of approach," says David Barber, a University College London professor and the OSIC's computational science lead. "What we're hoping for is to find new kinds of patterns in these CT scans that the radiologists have never even thought about before."[28]

[25] https://www.pwc.ch/en/insights/phrend.html
[26] https://www.osicild.org/
[27] https://www.pwc.com/us/en/library/case-studies/osic.html
[28] https://www.wired.com/video/watch/how-ai-is-creating-a-hopeful-future-for-patients-wired-brand-lab

Challenges ahead

While significant advancements have been made in fulfilling the promise of data in delivering precision life care, several challenges remain.

- Data compatibility and relevance problems persist. Many population-health genomic studies are dissociated from the research questions they should answer; electronic health record (EHR) data in many cases is still not linked or linkable to other biomedical/sensor data; and biobanks with patient material linked to EHR data have still not yielded new treatments.
- Data privacy is a challenge. The culture around data privacy varies by country, thus impacting data collection and research potential. In China, individuals don't own their data, and its use is considered a national good. In Scandinavia, individuals own their data and can opt out of sharing it, but there's a huge willingness to share it to drive research to help people stay healthy. In other countries, like the US, mistrust of pharmaceutical and tech companies affects people's willingness to share data.
- The AI- and data-driven transformation needed to deliver precision health requires collaboration between healthcare providers, pharmaceutical companies, payers, tech companies and the public sector, notes a PwC report titled Preparing for the data-driven future of pharma.[29] Although the covid pandemic accelerated infrastructure and data-sharing discussions, data privacy laws and antitrust rules can still inhibit precision health potential. In Europe, there's a push to create safe spaces to share data for research, but the challenge is making it a reality and ensuring that key players, like pharmaceutical companies, aren't excluded.

[29] https://www.strategyand.pwc.com/de/en/industries/health/data-driven-innovation-in-pharma/strategyand_data-driven-innovation-in-pharma.pdf

A strategic shift

The tools and technologies required to enable the shift from healthcare to precision life care already exist. But the structures and contexts that dictate incentives and behaviour aren't necessarily designed to encourage that shift. And, ultimately, the pace of progress will depend as much on the system's ability to adapt to new modes of working as on the pace of technological change and consumer uptake.

Despite moves in some countries towards value-based care, healthcare organisations are still largely reimbursed by public and private payers for the products and services they deliver. At the same time, most healthcare systems do not incentivise people to take responsibility for their health. Clearly, the business model needs to evolve to reward organisations for keeping people well and to make people much more responsible for their own health.

This shift to precision life care will only be possible if regulators enable payment systems that embrace this new model. Ecosystems that support precision health can only function if the return for participating stakeholders is commensurate with their investment. For example, in countries where systems include private health insurance, the payment scheme underpinning precision health must take into account the likelihood that patients may switch health plans before payer investments in wellness and prevention reap a financial benefit. Similarly, provider investments shouldn't simply accrue to payers in the form of lower healthcare spending.

As a health system shifts towards precision health, stakeholders will need to adapt their current strategies. Public and private payers will need to move from the one-year budget perspective to a multiyear health outcomes perspective. Pharmaceutical companies will need to decide whether they will focus on precision medicine solution development and provision, or serve as orchestrators that leverage data to match solutions to patients. The former would require a shift in the sales model as more prescriptions and treatment decisions are made using algorithms based on clinical effectiveness research.

Primary care providers will lay the foundation for precision health prevention and disease care, because they are most often the patient's initial interaction point. Maximising primary care providers' ability to guide patients' disease prevention activities likely will require upskilling. These providers will have to be comfortable with health monitoring technologies, data analysis, the availability of and appropriate referral for genetic tests and genome sequencing, and referrals to specialists and genetic counsellors when results indicate the need. Provider organisations will have to develop systems to make actionable data available at the point of care. Meanwhile, individuals will need to become more proactive about wellness and prevention, and take ownership of their health, including actively involving themselves in treatment decisions.

These all represent significant shifts – in mentality, in business approach, in capital deployment, in the distribution of profits and in the creation of value. But with so much significant change on the horizon, pursuing business as usual comes at a high cost. We have no doubt that investments to transform healthcare into a precision life care system will yield financial, personal and societal returns.

Contacts

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Methodology of the underlying survey

We conducted the market research in a representative population, ranging in age from 18 to 65, via the survey provider Appinio. A total of 1,500 people from the US, the UK, Germany, France, Italy, Spain and Japan were surveyed, with the US and Germany representing the largest share of respondents. The average age of the participants was 41. For most questions, multiple answers were possible. We consolidated the survey results, analysed them via different filters such as country, age group and health condition, and derived key insights.