

A Vision of Health in 2050 >>

It's 2050, and healthcare and society have been transformed by data, analytics and digital technology. How might an imaginary European country look like, if it's paired transformative technological change with brave, progressive policy decisions, to make it healthier, wealthier and happier? Our resident futurist Bogi Eliassen looks thirty years ahead to the digitalised, personalised healthcare of 2050.

A prevention revolution

In 2030, the government committed to spend half its healthcare budget on prevention. It started using data and analytics to track its progress. Doctors now use real-world evidence to help patients earlier – such as tracking a patient's cholesterol in real-time to prevent heart attacks later. As well as just living longer, people can live healthier, better quality lives, too.

Tackling health inequality

Health inequality is still a big challenge, not just between citizens of richer and poorer countries, but within countries too. The bottom 20% still struggle to access care. In 2030, the European Union launched an ambitious pan-European public health education initiative for all citizens aged 6 and above. This has boosted understanding of medical issues like vaccination, gene editing and using your personal health data, empowering people to manage their own health, and paving the way for society to benefit from the rapidly progressing science of the mid-21st century.

This second wave of democratisation of information can benefit everyone. Most people have become partners with their doctors when taking decisions about their health. But others might not have that capacity – for example, those dealing with addiction, long-standing illness, problems at home, poor mental health or financial troubles. Anticipating this, equality campaigners and policy makers have developed new kinds of social services to support the more vulnerable, intertwining personal care, online communities, family and workplaces to ensure support networks.



After failing to hit the UN's Sustainable Development Goal to deliver universal healthcare for all by 2030, the world health community acknowledged the importance of using high-speed global internet and artificial intelligence to leapfrog the old ways of organising health systems. Through ambitious public-private partnerships, the World Health Organisation led a global effort to roll out technology and hit the target in 2035, bringing 4 billion people the care they desperately needed.

Remote healthcare means physically visiting a doctor is no longer necessary, and can be replaced with a connection to the global data net. By 2030, high-speed internet has reached every citizen in corner of the globe, provided by governments and by major private actors, such as Amazon's network of thousands of low-orbit satellites. Paired with virtual and augmented reality tech, niche medical consultations can be provided anywhere, including in the most remote communities. More tech-savvy younger and middle-aged people prefer this instant connection to personalised treatment. But for older people or families, who prefer a human interaction, remote healthcare means GPs have more time per patient.

Empowered patients, democratised data

With technology providing more personal solutions for life's other challenges - like self-driving cars in transportation - people increasingly expect the public and the private sectors to work together to fix problems. Citizens, consumers and patients can spot when any system, including healthcare, has failed them, and organise online not just to highlight problems, but to co-create solutions by bringing together their huge quantities of data with their own personal needs, matched with specific expertise from across the globe.

This is just one vivid example of how a new Digital Social Contract is working in practice, with patients themselves driving how their own data can be used to improve their own treatment. It also requires global organisations - like big companies - to consider the consequences of what they do with data for people's health, making their responsibilities to society much clearer.

Of course, this focus on using data to prevent disease threw up ethical problems. Encouraging responsible health choices, like controlling your weight, is positive; but policy makers realised that it's not fair or effective to stigmatise those who can't easily manage those choices. The government introduced clear rules setting out the incentives for insurance companies. Their business models switched from managing the financial risk of a single person, to that of a whole populations, incentivising them to reward a healthier community.



Safe, responsible data use

By 2050, all healthcare providers can access health data safely and responsibly, based on a G20-driven global agreement on standards and requirements for health data interoperability, inspired by the International Telecommunication Union (ITU). In Europe, countries signed the GDPR 2033 Basel Agreement, building on the concept of European Reference Networks to make the individual the official carrier of their own data. Citizens were given the right to access and use any data involving them.

Major concerns about data privacy and security were tackled by Blockchain-style distributed ledger-enabled technology, making it easier to enforce the right to use data in different settings. Policy makers take a networked approach to regulating and governing health data, so it can be safely shared across borders. Now, people are more concerned about the ethical implications of failing to use data responsibly, to prevent illness or find a better treatment.

Considered radical in 2020, the concept of a 'humanome' now informs how people manage their health and many other aspects of their lives. Building on the 2010s' focus on the genome, each person can be described by a combination of data about their biology, genome, behaviour & activity, preferences about what's most important to their quality of life, and information about the environment they live in. So data isn't divided into siloes depending on who generated it (a researcher, a doctor, a patient); it's centred on, owned by, and managed by, that one human. The humanome means a much deeper understanding of biology, disease and health, prompting a boom in medical research and development, breakthrough vaccines, treatments and cures. Genomic sequencing of our natural environment, combined with the human genome, has created a whole new understanding of disease.

The connected individual and the humanome

If prevention fails, and treatment is needed, these developments mean treatments can be highly personalised, not just by doctors, but by the patient themselves. They are now a connected individual, being treated not as an illness or a disease, but a whole person - based on their other ailments, their lifestyle and quality of life preferences. That means their treatment is more likely to work for them; easier to stick to; and more cost-effective. Patients have a much stronger voice; they have more power to decide with their doctor what's best for them.

Because people understand their health so much better through data, our health is inextricably bound with our identity. Whereas in the early 21st century, young people saw wellbeing and health as a way to showcase a 'perfect' lifestyle, maintaining a healthy lifestyle is seen as a wise, responsible investment - like education and training. The younger generation are empowered to make healthy choices, and to support those in society who can't.



Artificial intelligence has made big data useful to manage a whole population's health, and each individual's. It can analyse thousands of patients' data to get a clearer understanding of diseases. It can also create a Digital Twin – a virtual model of one patient, to check whether a treatment will work well and safely on them. This has transformed clinical trial models, where placebos are now rarely used. It's improved quality of life, enabling doctors to predict and manage side-effects for those in ongoing treatment.

The 2020 Earth BioGenome Project, which pioneered the sequencing movement, made genetic sequencing an accepted element of modern life and drove the price of sequencing down significantly. It has also facilitated gene editing, which by 2035 became cheap enough for mass usage by doctors and researchers. As part of broader public health campaigns, gene editing is a mainstream topic, with broad public understanding of the potential of the technology leading to strong support for innovation. Genomics are commonly used in lifestyle tools like fitness apps, and they inform how people decide their diet choices, supplements, and even which pet to get.

Affordable progress and innovation

Constant medical breakthroughs threatened to break health budgets as the 2020s progressed, generating fears that health systems would simply have to choose between cutting-edge medicine and affordable medicine. But a solution lay in two major recent developments. Politicians had made it clear that prevention was as valuable as treatment; and personal health data hugely increased doctors' understanding of how an individual experiences their illness. This drove the development of new ways to value and pay for health services.

Payers changed how they made decisions about what to buy, measuring not just the short-term budget impact, but the longer term costs and savings. Forward-thinking policy makers thought not just about immediate health budget savings, but about the economic benefits of getting sick people back to work, or the social benefits to a family with small children of having healthy, active grandparents.

Perhaps most importantly, the system stopped being based around the budget holder – the hospital or the ministry of health, for example – and budgets began to be targeted on the individual person. That meant more convenient care, earlier intervention and testing, and faster, better treatments. So, where more money was spent on better prevention and treatment, less money could be spent on covering the longer-term costs of chronic and serious illness.



A note from the author

“This is an aspirational scenario. Some might describe it as wishful thinking; but to make the right decisions and the right policy, we must be ambitious, and positive, in what we can achieve in the next thirty years. This isn’t just wishful thinking. The developments I suggest are based on developments that are already taking place now.

We can’t know precisely how our transition to a more digitalised, personalised healthcare systems will happen. But we know it will happen. It’s already happening. The challenge is to anticipate, to collaborate, and to take charge of how we want our world to look by 2050.”